

**BEFORE THE PUBLIC UTILITIES COMMISSION OF THE
STATE OF CALIFORNIA**

Order Instituting Rulemaking Concerning Energy
Efficiency Rolling Portfolios, Policies, Programs,
Evaluation, and Related Issues.

Rulemaking 13-11-005

**SOUTHERN CALIFORNIA EDISON COMPANY'S (U 338-E)
AMENDED 2023 ANNUAL REPORT FOR ENERGY EFFICIENCY
PROGRAMS**

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Dated: **May 30, 2024**

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REPORT FOR ENERGY EFFICIENCY PROGRAMS**

Southern California Edison Company (SCE) hereby submits its Amended 2023 Energy Efficiency (EE) Annual Report (Annual Report) for its Energy Efficiency programs and results for Program Year 2023, as Attachment A hereto.

The Amended Annual Report is filed and served in this proceeding pursuant to the Administrative Law Judge’s (ALJ) Ruling Adopting Annual Reporting Requirements for Energy Efficiency and Addressing Related Reporting Issues dated August 8, 2007. In addition, in compliance with Commission Decision (D.) 18-01-004, Addressing Third Party Solicitation Process for Energy Efficiency Programs, SCE is including in this Annual Report a list of all third-party contracts in place, along with the information in Ordering Paragraph (OP) 8 of that Decision, in Appendix C, Table 1 and Appendix A, Section 12.

SCE is concurrently filing a Notice of Availability of the 2023 Amended Annual Report and its appendices and related documents available for viewing and downloading for the parties on the Proposal Evaluation & Proposal Management Application (PEPMA) website.

Respectfully submitted,

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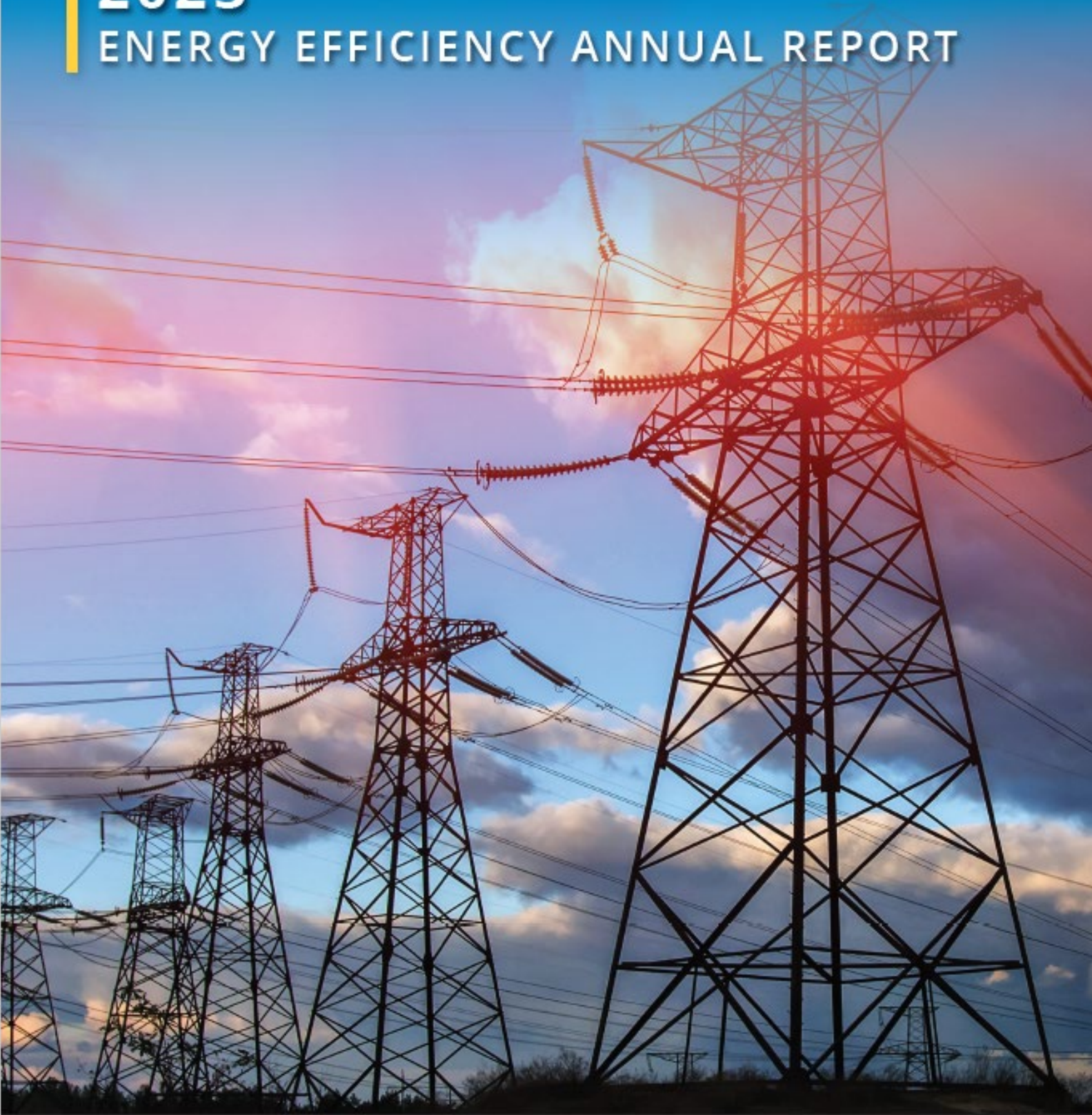
May 30, 2024

Attachment A

**SCE's Amended 2023 Energy Efficiency
Annual Report**

2023

ENERGY EFFICIENCY ANNUAL REPORT



May 30, 2024



SOUTHERN CALIFORNIA
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Executive Summary

Southern California Edison Company (SCE), one of the nation's largest Investor-Owned Utilities (IOUs), prides itself on successfully delivering safe, reliable, clean, and affordable energy throughout Southern California. Offering customers long-term, sustainable energy-efficient choices is essential to our continued success.

SCE's 2023 Energy Efficiency (EE) Annual Report covers the year's results and outlines future EE priorities. SCE is committed to achieving a cost-effective portfolio while providing clean, reliable EE solutions to our customers as we move forward in our decarbonization journey. In 2023, SCE examined its portfolio and began to restructure under-performing third-party contracts. Reassessing the portfolio to address challenging market conditions, along with longer-than-anticipated lead times to onboard new programs, resulted in spending 60% less than the 2023 authorized budget¹ of \$369 million.

SCE's Energy Efficiency portfolio did not meet its California Public Utilities Commission (CPUC or Commission)-approved energy savings goals² (see inset) for net Demand Reduction (kW) or Total Resource Cost (TRC) ratio. In 2023, Energy Efficiency kW and kWh metrics reported 47% and 28%, respectively, excluding Codes and Standards.³ Compared to 2022, SCE's net electric energy savings in 2023 increased from 42% (178 GWh) to 47% (217 GWh), and the TRC ratio of 0.52 in 2023, without Codes and Standards, decreased from 0.64 in 2022. SCE's residential Home Energy Advisor (HEA), Comprehensive Commercial Program, and Industrial Strategic Energy Management (SEM) Program represent 88% of the portfolio kWh energy savings.

The benefits of reaching new codes and standards will have significant impacts for both residential and commercial energy efficiency markets statewide. SCE continues to meet its Codes and Standards goals year after year, which demonstrates SCE's focus, commitment, and

SCE Reports its 2023 CPUC Adopted Savings Results and Cost-Effective EE Portfolio (Excluding Codes and Standards)

In 2023, SCE achieved:

- **47%** of its net electric energy savings goal (**217** net annual GWh)
- **28%** of its net electric demand reduction goal (**19** net demand reduction MW)
- Cost-effectiveness of **0.52** TRC ratio, **0.627** RIM and **0.629** PAC
(see *Appendix A, Section 4, Expenditures and Cost Effectiveness*)
- Average electric rate of **\$0.22/kWh** and first year ratepayer bill savings of **\$47.6** million
- Avoidance of **378,129** net tons of carbon dioxide (CO₂) emissions annually
- Hard to Reach (HTR) and Disadvantaged Communities (DACs) net annual electric energy savings of **4.1** GWh

¹ Energy Efficiency portfolio budgets do not include EM&V budgets for REN programs, the \$14M Finance Revolving Loan Program, and the \$74.7M AB841 budget.

² D.21-05-031, *Assessment of Energy Efficiency Potential and Goals and Modification of Portfolio Approval and Oversight Process*.

³ The Codes and Standards Program is not included when referencing energy savings results compared to goals for TRC, kW, and kWh. For energy savings results compared to goals that will include Codes and Standards, see *Appendix A*, below.

successful long-term planning in Codes and Standards. When factoring in Codes and Standards for 2023, SCE achieved 120% of its kWh and 117% of the kW portfolio goals and exceeded Commission-set goals for the past few years.

Because the Program Year 2023 results (excluding Codes and Standards) were lower than anticipated, SCE is taking numerous actions to improve savings and total system benefits (TSB). In January 2024, SCE completed the solicitation process for four Strategic Energy Management (SEM) contracts with third-party implementers in the Commercial, Agriculture, and Industrial sectors. Upon CPUC approval, these contracts, which total over \$90 million, are expected to provide net electric energy savings of approximately 200 GWh over six years. SCE also continues to engage with energy efficiency industry stakeholders to discuss operational changes that help improve and simplify processes that will increase customer participation across all EE customer sectors.

New Equity Programs

During 2023, SCE launched three new third party-implemented equity⁴ programs. These include two residential programs, the Residential Energy Advisor Program and the Disadvantaged Community Marketing Outreach (DACMO) Program, and one nonresidential program, the Small / Medium Business (SMB) Simplified Savings Program. These contracts total more than \$31 million dollars over their respective terms. SCE has worked with the third-party implementers to deliver these programs that focus on Hard-to-Reach (HTR) and Disadvantaged Community (DAC) customers to reduce barriers to energy efficiency adoption.

Decarbonization Through EE Codes and Standards

Promoting decarbonization through building codes and standards is an integral part of SCE's residential and commercial EE efforts. SCE estimates that over the next 10 years, new and updated energy codes and standards will result in significant avoidance of carbon dioxide (CO₂) emissions.

In 2023, the EE portfolio made significant strides in advancing California's energy efficient decarbonization efforts through Codes and Standards initiatives. The Statewide team successfully completed 18 Codes and Standards Enhancement (CASE) reports, saving more than 370 GWh and reducing 158,000 metric tons of CO₂ emissions.

SCE collaborated with PG&E on the 2025 Title 24 Building Energy Code update, which, if approved, will integrate a groundbreaking furnace with energy efficiency heat pump retrofit requirements. Last year SCE also saw substantial support and progress on appliance standards, commenting on 49 federal appliance standards and seven state appliance standards. A significant milestone was achieved when ENERGYSTAR[®] agreed to phase out gas appliances from its labeling and promotion program to guide customers to the most cost-efficient electric equipment available.

⁴ D.21-05-031 at p. 2: "The budget amount devoted to the market support and equity programs will be limited to 30% of the total budgets, except in the case of the regional energy network program administrators, who will not be subject to these limits because of the different nature of their portfolios."

The Codes and Standards Reach Codes Subprogram, which supports Building Performance Standards (BPS) for existing buildings, worked with seven jurisdictions, including Los Angeles County. The Code Compliance Improvement Subprogram provided 94 training classes with over 2,200 attendees and published a Multifamily All-Electric Case Studies Book. The future of building energy modeling, which underpins the strategic planning and coordination of code activities, was a key topic at the California Building Energy Modeling (CalBEM) 2023 Symposium and the Emerging Technologies (ET) Summit 2023, both hosted by SCE.

Energy Efficiency with Emerging Technology

Advancing emerging technologies is critical to achieving carbon neutrality across the state's economy by 2045. As lead administrator of the third party-led, Statewide Emerging Technologies Program (SWEETP), SCE continues to support carbon neutrality by addressing gaps in and needs of the IOU EE portfolio and research endeavors by Codes & Standards. SWEETP activities include identifying and evaluating emerging commercially available and/or underutilized technologies and their applications to enable their increased adoption in the Portfolio, communicating project results to the market and stakeholders, and advancing industry understanding of the evaluated technologies to support technology transfer.

In 2023, SWEETP supported progress toward the state's climate goals through housing characterization studies of single- and multifamily and manufactured housing in HTR and DACs to identify gaps and opportunities toward electrification and assessing the viability of heat pumps using low-GWP refrigerant, including CO₂, and challenges against adoption of air-to-water heat pumps. In addition, electrification of hot water systems in commercial kitchens continues to make strides. The *Commercial Kitchen Hot Water System Design Guide* was updated to include demonstrations of electrification and EE opportunities within commercial kitchens' domestic hot water systems. The new *Guide* also identifies challenges in heat pump-assisted hot water systems in food service facilities.

For Program Year 2023, the legacy Emerging Technology Program (ETP), the IOU-led emerging technologies program, continued to make strides toward California's goal of deploying six million heat pumps by 2030 by conducting laboratory evaluation of small wall-mounted heat pump water heaters (HPWH) suitable for low-demand, point-of-use needs in small residential occupancies; testing eight 120V HPWHs in SCE territory as plug-and-play solutions to meet retrofit market needs and address any opportunities and gaps associated with market adoption of all-electric hot water heating; and evaluating impacts of central air-source CO₂ HPWH systems in multifamily buildings, among other evaluations.

Energy Efficiency Addresses Challenges

SCE's efforts to enhance its program portfolio, achieve its energy savings goals, and expand market transformation work continued in 2023, despite challenges and competing objectives, as SCE explained in the 2023 True-Up Advice Letter (TUAL).⁵ Challenges like the

⁵ Advice Letter (AL) 5123-E-A, *Supplement to Southern California Edison Company's Energy Efficiency Program and Portfolio True-Up Advice Letter for Program Years 2024-2027*.

change of regulatory policy transitioning to TSB metrics, the competing portfolio objectives of meeting cost-effectiveness versus savings goals attainment, and the circumstance that multiple program administrator portfolios are serving similar customers, have hindered SCE's ability to achieve CPUC compliance goals.

In addition, SCE's comments to the Potential and Goals Study explain⁶ the challenges of accurately forecasting SCE net energy savings goals when faced with ever-changing market conditions. Drivers mentioned in SCE's TUAL comments include: significant changes in the EE markets, the COVID-19 pandemic, rapid inflation, changes in savings calculations and measure eligibility after contracts had been executed, and delays in regulatory approvals, to name just some of the unexpected challenges."

Looking Forward

Looking ahead, SCE is building stronger partnerships with current and future third party implementers and soliciting offerings that will lead to a broader and more diversified base of third-party implementers. To support these efforts, SCE is planning to release new Requests for Proposals (RFPs) rapidly when existing contracts end early or underperform.

SCE will continue to develop new processes and tools that will add value for effectively managing performance and strengthening relationships with third-party program implementers, with a focus on enhanced compliance with CPUC-approved portfolio targets. In addition, SCE will continue to target high-potential sectors that increase opportunities for improved performance. Finally, SCE will stay aligned with the CPUC's objectives and policy while striving to strengthen relationships and collaboration efforts with our Regional Energy Networks (RENs).

Go on to the next page

⁶ Potential and Goals Study 2024-2035 p. 35: "SCE and CEDMC maintain that the Commission should adopt Scenario 1, repeating and adding to their prior arguments that indicate Scenario 2 is not realistically achievable. This decision maintains that Scenario 2 reflects aggressive yet achievable goals."

1. Residential Sector Energy Efficiency Programs

SCE's residential Energy Efficiency (EE) portfolio⁷ employs various strategies and tactics to overcome market barriers and to deliver cost-effective programs and services aligned to support customer needs and the goals of the California Energy Efficiency Strategic Plan (CEESP). The programs in SCE's 2023 residential portfolio include:

- Home Energy Advisor Program
- Residential Energy Advisor Resource and Non-Resource Equity Programs
- Disadvantaged Communities Marketing and Outreach Non-Resource Program
- Residential Direct Install Program
- Comprehensive Manufactured Homes Program
- Willdan Multifamily Energy Efficiency Program
- AB 793 Residential Pay for Performance Program
- Market Access Program (aka Summer Reliability Program), and
- Enervee Marketplace Program.

These residential programs target energy savings and demand reduction by implementing strategies to provide education, awareness, and rebates for viable EE technologies that may help customers afford equipment upgrades. The programs are available to homeowners, renters, multifamily⁸ property owners, and new construction builders.

In 2023, SCE worked with various industry stakeholders, including manufacturers, distributors, contractors, and governmental, educational, and housing organizations to create awareness of offerings available to residential customers.

Two Residential sector programs were closed to new applications but were still completing committed projects at the end of 2023:

- Plug Load and Appliances Program, and
- Residential New Construction Program.

Home Energy Advisor (HEA) Program

Program Description

The Home Energy Advisor (HEA) Program focuses on implementing behavior intervention strategies designed to help customers understand and manage their household energy use. HEA offers customers an interactive online tool to engage and encourage them to reduce energy, water, and gas consumption by recommending EE tips, EE programs,

⁷ Program budgets and forecast comparisons are available at [2023 SCE Budget Filing Dashboard - CEDARS \(sound-data.com\)](#).

⁸ SCE defines "multifamily" as a housing classification where separate housing units for residential inhabitants are contained within one building or several buildings within one complex or residential building that houses more than one family at a time. Apartments, condos, townhouses, duplexes, and quadruplexes are examples of Multifamily housing options.

behavior changes, and other related information. HEA also implements Home Energy Reports (HERs) using Randomized Control Trials (RCTs), which incorporate social science techniques to change or improve customers' energy-related behaviors, provide energy reduction information, and ensure confident savings evaluations.

Activity in 2023

In 2023, SCE distributed HERs to more than 1.3 million residential customers. SCE also continued offering HERs to customers with Electric Vehicles (EVs). Overall, HER recipients benefited from numerous EE recommendations, tips, and links to helpful EE-related content. HERs helped customers reduce more than 90 GWh of energy and 11 MW of peak demand.

Integrated Demand Side Management (IDSMS) Activities

Integrated Demand Side Management (IDSMS) topics were promoted to offer residential customers a comprehensive approach to energy management. Key IDSMS tips offered included Smart Thermostat benefits and understanding Time-of-Use Rates.

Online Buyer's Guide

The Online Buyer's Guide remains available⁹ for customers to research topics such as Building Materials, Heating and Cooling, Lighting, Kitchens, Laundry, and Plug Loads. Helpful tools and tips are available to guide customers in selecting more energy-efficient products.

The site also provides helpful information to support customer choices regarding lighting, appliances, and building materials, and includes links to SCE's other helpful tools and programs, such as rebates and the EEAT.

CLEAResult Residential Energy Advisor Resource and Non-Resource Equity Programs

CLEAResult's Home Performance Plus program is offered to Southern California Edison residential customers who rent or own a single-family detached home or unit in a building with a maximum of four units within designated ZIP Codes. Through this program, customers can receive a no-cost energy assessment of their home, enhanced rebates for energy-saving upgrades and free, one-on-one guidance on improving their home's energy efficiency, health and comfort.

Activity in 2023

SCE executed a contract with implementer CLEAResult Consulting, Inc. on March 31, 2023. As of December 31, 2023, the programs were continuing to prepare to launch; no projects had been submitted to SCE for review. CLEAResult is currently working to develop

⁹ Online Buyer's Guide website, available at <https://www.sce.com/residential/home-energy-guide>.

the necessary processes needed to support program execution, including project plans, aligning subcontractors, and creating marketing materials. SCE anticipates that the program will launch in Q2 2024.

Global Energy Services Disadvantaged Communities Marketing and Outreach Non-Resource Program

The Disadvantaged Communities Marketing and Outreach (DACMO) program targets Disadvantaged Communities (DAC) and Hard-to-Reach (HTR) and underserved communities to increase SCE residential customers' participation in Energy Efficiency (EE), Demand Response (DR), and Electrification programs. DACMO aims to address barriers to participation by providing a marketing and outreach program with multilingual staff, an advertising campaign that targets language-specific local media, a toll-free hotline, a multilingual website, booths at community events, social media presence, and home energy advisements.

Strategies Implemented in 2023

SCE executed a contract with Global Energy Services (GES) to design and implement the third-party DACMO program effective March 31, 2023. The Implementation Plan was uploaded to CEDARS on May 30, 2023.

SCE and GES collaborated closely throughout the remainder of 2023 to prepare the program for launch. As of December 31, 2023, GES had successfully developed plans to distribute 8,000 door hangers and conduct 30 outreach events, 204 media and radio advertisements, and 400 energy advisements beginning in Q4 2023.

Residential Direct Install Program

Program Description

The Residential Direct Install (Res DI) Program provides direct installation of comprehensive EE measures to residential customers at no cost to them, targeting specific geographic areas to alleviate energy hardship and electric system constraints and to assist lower-income customers who are not eligible for income assistance programs. The program enhances the EE knowledge and program participation of the targeted residential customers, to encourage them to undertake more extensive EE activities and retrofits.

The program collaborates with gas utilities and water agencies to promote both EE and water conservation. This approach provides customers with both EE measures and water conservation measures, such as high-efficiency toilets, low-flow shower heads, and faucet aerators.

Strategies Implemented in 2023

- Continued installation of comprehensive EE measures (listed below) to optimize energy savings and help customers identify opportunities to participate in demand response programs and to use water more efficiently.
- Continued face-to-face interactions with customers.

Collaboration with External Partners

SCE continued to contribute to the pilot led by the Alliance for Water Efficiency in collaboration with Long Beach Water. The pilot, which began in 2022, was implemented to determine how much water, energy, and natural gas savings could be achieved through a direct install program for homeowners who might not otherwise have the resources to upgrade. This collaborative effort included contributions from the Metropolitan Water District, Long Beach Energy Resources, Long Beach Water, Alliance for Water Efficiency, and SCE, along with generous donations of high-efficiency toilets and clothes washers from Kohler and Whirlpool, respectively.

Door-to-door canvassing efforts took place in assigned neighborhoods within Long Beach Water's service area in Long Beach. All applicable program offerings from each contributing organization were promoted. Eligible participants received one or more of the following measures:

- High-Efficiency Toilets
- High-Efficiency Washers
- High-Efficiency Dryers
- High-Efficiency Storage Water Heaters
- Low-Flow Showerheads
- Faucet Aerators
- Fan Delay Controllers
- Smart Thermostats
- Duct Testing and Sealing, and/or
- Brushless Fan Motors

Qualification was based on factors such as existing Gallons Per Flush (GPF), age of appliances, and whether existing appliances were ENERGYSTAR[®]-certified. Approximately 80 home assessments were performed, and through these assessments, over 115 high-efficiency toilets, more than 25 high-efficiency washers, almost 30 high-efficiency storage heaters, and over 40 low-flow showerheads were installed.

Integrated Demand Side Management (IDSMS) Activities

The program continued its partnership with the Demand Response (DR) Smart Energy Program (SEP), enrolling eligible customers in SEP by leveraging Smart Thermostat installations. A pre-screening process was used to identify SEP-eligible customers. During Res DI installation appointments, pre-screened customers were educated on the benefits of

participating in SEP. Customers who expressed interest and consented to SEP enrollment had their enrollment facilitated by the Res DI Program implementer.

This partnership continued to illustrate the value of IDSM, helping to meet grid needs with increased demand response MW capacity and providing cost-effective EE savings by installing Smart Thermostats. Res DI installed over 6,000 Smart Thermostats in 2023, and over 1,800 customers who received them were enrolled in SEP, resulting in an approximate 30% EE-to-DR enrollment conversion.

Outreach to Customers

- The program continued customer outreach and enrollment primarily through door-to-door canvassing, word of mouth, and leveraging program landing pages on both SCE.com and the implementer's website.¹⁰
- New in 2023, SCE's Corporate Communications collaborated with television station KESQ-TV located in the Palm Springs area to provide a spotlight on the Res DI program. Representatives from the station attended a couple of Res DI installations in the area to film the work being performed and interview participating customers. On August 4, 2023, KESQ-TV ran three news segments throughout the day, which generated over 300 leads for the Res DI program.

Comprehensive Manufactured Homes Program

Program Description

The Comprehensive Manufactured Homes (CMHP) Program is a direct install program designed to provide comprehensive EE services to mobile home and manufactured-home customers, in collaboration with local communities seeking to maximize service to their residents. The program, implemented in coordination with the Southern California Gas Company (SoCalGas), installs energy-efficient products at no charge in mobile home dwellings located in mobile home parks.

The target customers for this program, those living in mobile homes in mobile home parks, are difficult to reach through other EE programs. These customers are typically moderate- or fixed-income, elderly, retired, and/or disabled individuals. The program is designed to enhance EE knowledge and program participation in this market segment.

¹⁰ Residential DI is available at <https://www.sce.com/residential/rebates-incentives-saving-tips/residential-direct-install-program>. Synergy Residential DI is available at <https://www.synergycompanies.com/utility-program/sce-smart-energy-program>.

Strategies Implemented in 2023

Core Function Activities

- Continued installation of comprehensive EE measures (such as Smart Thermostats, fan delay controllers, brushless fan motors, duct testing and sealing, low-flow showerheads, and duct optimization) to optimize energy savings and help customers identify opportunities to participate in other programs and to use water more efficiently.

Outreach to Customers

- Continued outreach to mobile home parks that had not previously participated in the program. The implementer conducted this outreach through in-person and virtual presentations for mobile home park managers and their staff. This effort included mobile-home and manufactured-home parks and communities restricted to residents aged 55 or older.

Collaboration with Internal Partners

- Continued collaboration with SCE's Meter Conversion program to promote and provide CMHP services to customers who were impacted by construction work required for meter conversion. Program representatives attended a Meter Conversion community forum to inform residents of CMHP's offerings and drive program enrollment.

Collaboration with External Partners

- Continued partnerships with various mobile home community management companies to promote CMHP services and distribute program materials. Through these efforts, hundreds of leads were generated for the program.
- Participated in presentations and discussions with members of both the Western Manufactured Housing Communities Association and the Manufactured Housing Educational Trust to promote CMHP offerings.

Willdan Multifamily Energy Efficiency Program

Program Description

The Willdan Multifamily Energy Efficiency Program (MFEEP) is designed to provide comprehensive EE solutions for all multifamily (MF) customer segments of the residential sector across Southern California Edison's (SCE's) service area.

Strategies Implemented in 2023

SCE submitted Advice Letter (AL) 4350-E-A¹¹ in 2021 to request approval for Willdan MFEEP,¹² and the CPUC approved the request on July 20, 2021. During 2023, SCE and the MFEEP implementer experienced challenges related to reduced measure offerings, customer recruitment, increased competition, and other factors. The implementer proposed an alternative path for SCE's consideration to deliver projects in a difficult market.

SCE showed its commitment to the success of this program by working closely with the implementer throughout their contract. However, SCE and Willdan ultimately decided to close the program in 2024; MFEEP delivered no kWh energy savings in 2023. The program funds are to be reallocated to areas within SCE's portfolio that are more cost-effective.

AB 793 Residential Pay-for-Performance Program

Program Description

In 2017, California Assembly Bill (AB) 793¹³ and the associated CPUC Resolution E-4820¹⁴ mandated that all California IOUs develop and implement incentive programs to promote Energy Management Technologies (EMTs) to residential and Small and Medium Business (SMB) customers. EMTs include products, services, or software that allow customers to better understand and manage electricity and/or natural gas consumption in their homes or places of business.

Strategies Implemented in 2023

Pursuant to the requirements of AB 793 and Resolution E-4820,¹⁵ SCE carried out the following activities in 2023 to meet compliance requirements:

- Offered rebates for EMT products such as Home Area Network (HAN) devices and Smart Thermostats (which remain available through SCE.com)
- Continued to offer Home Energy Reports (HER), which will continue through 2024, and
- Reported metrics. For details, see *Table 1.1, AB 793 Energy Management Technology (EMT) Metrics*, shown below.

¹¹ AL 4350-E-A, *Southern California Edison Company's Supplemental Advice Letter for Approval of Residential, Commercial, and Industrial Energy Efficiency Third Party Contract for Comprehensive Multifamily Program*.

¹² AL 4350-E-A also included the Willdan Commercial EE Program and the Industrial EE Program, described respectively in *Chapter 2* and *Chapter 3*, below.

¹³ AB 793, *Energy Efficiency*.

¹⁴ Resolution E-4820, *Request for Approval of PG&E, SDG&E, SCE and SoCalGas' AB 793 Advice Letters (ALs)*.

¹⁵ Resolution E-4820, *Ordering Paragraphs (OPs) 1a-1e, OPs 2a-2b, and OP 3*.

Table 1.1. AB 793 Energy Management Technology (EMT) Metrics

Description		Metric	Marketing Target Segments	2021	2022	2023
Customer Engagement	Marketplace Home Page	Count of clicks to Home Page ¹⁶	Mass Market / Low Income / DAC	192,843	208,598	124,990
	Marketplace – Purchase Interest	Count of clicks on the "Buy" button, leading to the retailer site	Mass Market / Low Income / DAC	41,611	45,276	45,287
	Marketplace – Clicks to Rebate	Count of clicks by category / type of rebate	Mass Market / Low Income / DAC	39,316	48,583	49,857
	Energy Management Center Landings	Count of clicks on EMC landing page	Mass Market / Low Income / DAC	33,105	35,938	32,648
Customer Uptake	Smart Thermostat Rebates	Count of EE Rebates	Mass & Target Markets	0	0	0
		Count of DR Program Enrollment Rebates	Mass & Target Markets	12,197	16,528	17,401
	In-Home Display Device Rebates	Count of Rebates	Mass & Target Markets	200	358	299
	Green Button Download My Data	Number of Green Button downloads	Mass Market	351,221	445,692	480,292
	Green Button Connect My Data	Count of completed 3rd Party authorizations	Mass Market	534	484	855

Market Access Program

Program Description

SCE's Market Access Program (MAP), marketed to the public as the Summer Reliability Program (SRP), offers participants performance-based compensation to reduce energy usage during times of high grid stress, with the goal of avoiding rotating outages while minimizing costs to ratepayers. The program assists commercial and residential customers to purchase and install EE measures to reduce electricity demand for the 2022 and 2023 summers. MAP installations were extended by the CPUC through March 31, 2024, to provide additional demand reduction.

¹⁶ Please note that the 2021-2022 Marketplace Home Page click counts have been revised for accuracy.

The Program focuses on peak energy reduction that qualifying vendors, called Trade Professionals, provide to help customers participate in energy efficiency programs. These Trade Professionals directly recruit and engage with targeted customer segments that demonstrate high peak energy usage for a select group of measures.

Strategies Implemented in 2023

Core Function Activities

- Completed almost 6,000 Residential installations consisting of efficient Electronically Commutated Motors (ECMs) for Central HVAC Condensers, LED Parabolic Aluminized Reflector (PAR) Lamps, and Whole House Fans.
- Completed over 140 Commercial installations consisting of lighting retrofits and Energy Management System (EMS) controls.
- Enrolled more than 20 Trade Professionals into the program.

Outreach to Customers

- Hosted a webinar in June to provide program updates to Trade Professionals on topics such as installation deadline extension, remaining budget available, and changes to the program manual.
- Continued a direct marketing campaign to Trade Professionals that participated in SCE's legacy EE programs.

Enervee Marketplace Program

Program Description

Enervee's Marketplace Program consists of an online marketplace that fulfills many of SCE's energy management technology marketplace obligations under CPUC Resolution E-4820.¹⁷ The Enervee Marketplace provides an online shopping platform to drive SCE residential customers toward more energy efficient consumer products.

The platform provides information on retail prices, product efficiency, operating costs, and savings. This allows SCE customers to compare the total cost of ownership for different products, inclusive of product cost and energy bill savings. The program also offers SCE customers inclusive, low-interest Eco Financing, as well as a variety of stacked incentives, to overcome financial barriers to purchasing energy-efficient products without Investor-Owned Utility (IOU) ratepayer-funded EE rebates.

Eco Financing offers instant online underwriting of long-term loans with minimal credit requirements. This enables customers to purchase energy-efficient products using a

¹⁷ Resolution E-4820. *Request for Approval of PG&E, SDG&E, SCE and SoCalGas' Assembly Bill 793 (AB 793) Advice Letters (ALs).*

\$0-down term loan with an affordable, fixed annual percentage rate (APR) of interest, backed by the California Hub for Energy Efficiency Financing (CHEEF) GoGreen Home Residential Financing Program.¹⁸ Customers have the option to bundle installation and other services in their Eco Financing loan; they also have a choice of additional payment methods. However, SCE only claims savings for eligible measures that are purchased using Eco Financing.

Activity in 2023

In 2023 SCE and Enervee focused predominantly on aligning on Measure Package (workpaper) documentation requirements and seeking CPUC approval for a necessary exception to a documentation requirement, to enable program implementation.

Enervee delivered over 250 projects, all of which were deemed measures, in 2023, resulting in over 21,000 net kWh in savings.

Despite the progress achieved in 2023, the Marketplace program encountered challenges with market penetration and limited savings from qualifying measures and purchases made solely using Eco Financing. These challenges have impacted the program's ability to fully scale.

Closed Residential Sector Programs

Residential New Construction (RNC) Program

The only remaining Residential New Construction (RNC) Program is its sub-program, the California Advanced Homes Program (CAHP). CAHP provides comprehensive support for saving energy in the residential new construction sector. Through a combination of education, design assistance, and financial support, CAHP works to encourage the building and related industries to exceed California's Title 24 Building Energy Efficiency Standards,¹⁹ and to prepare builders for future changes to these standards.

To prepare for the transition to the new Statewide RNC program, California Energy Smart Homes Program, led by PG&E as the Program Administrator (PA) launched in January 2022 and CAHP closed to new enrollments on October 31, 2021. In 2023, CAHP continued to advance existing eligible projects through the program pipeline, including technical review as required, and will continue to do so until all projects have been completed and paid.

ICF Residential Behavior Program

The ICF Residential Behavior program was formally closed on October 13, 2022. SCE hosted a public webinar on January 4, 2023, to stakeholders on the ICF Residential Behavior program closure.

¹⁸ See *Chapter 6, Finance Programs*, below.

¹⁹ California Building Energy Efficiency Standards, California Code of Regulations, Title 24.

2. Commercial Sector Energy Efficiency Programs

SCE's Commercial sector Energy Efficiency (EE) programs²⁰ offer technical support (such as facility audits, calculations, and design assistance) and rebates and incentives to provide Demand Side Management (DSM) solutions that help commercial customers save energy and money. Targeted segments include distribution warehouses, office buildings, hotels, motels, restaurants, food service, schools, universities, colleges, hospitals, high-tech facilities, biotechnology facilities, retail facilities, and smaller customers with similar buying characteristics.

The Commercial sector program portfolio includes:

- Small / Medium Business Equity Program (aka Simplified Savings)
- Commercial Energy Advisor Program
- California Statewide Lighting Program
- Willdan Commercial Energy Efficiency Program
- Market Access Program (aka Summer Reliability Program), and
- ICF Commercial Behavioral Program.

The following Commercial sector programs were closed to new applications, but were still completing committed projects in 2023:

- Commercial Calculated Energy Efficiency Program
- Savings By Design (SBD) Program, and
- Enhanced Retro-Commissioning Program.

Resource Innovations Small / Medium Business Equity (Simplified Savings) Program

The Simplified Savings Program aims to deliver meaningful energy bill savings to Southern California Edison's Small and Medium Business (SMB) customers operating within Disadvantaged Communities (DAC) and/or who are considered Hard-to-Reach (HTR) customers. The Program achieves this through local partnerships with Trade Allies (TAs) such as The Ortiz Group, Environmental Innovations (EI), and California Green Business Network (CAGBN), as well as Community Based Organizations (CBOs) for customer outreach. These partners will offer services such as energy education, bill analysis, free direct install (DI) measures, and incentives for higher impact energy saving measures. The focus is specifically on non-residential SCE customers with a monthly maximum demand below 200 kW.

²⁰ Program budgets and forecast comparisons are available at [2023 SCE Budget Filing Dashboard - CEDARS \(sound-data.com\)](https://www.scedars.com/sound-data).

Strategies Implemented in 2023

SCE executed a contract with Resource Innovations to design and implement the third-party Simplified Savings Program effective May 22, 2023. The program was approved via CPUC Advice Letter 5072-E Disposition with an effective date of August 10, 2023, and the Implementation Plan was uploaded to CEDARS on October 16, 2023.

SCE and Resource Innovations collaborated closely throughout the remainder of 2023 to prepare for program launch, including aligning on measure package documentation requirements for both resource and non-resource measures and ensuring proper system access. However, because of the expiration of a number of measures, Resource Innovations had to revisit their resource measure mix, which contributed to delays in program launch. As a result, the Simplified Savings program did not deliver any projects or savings in 2023.

Commercial Energy Advisor Program

Program Description

The Commercial Energy Advisor Program included one component in 2023, Building Benchmarking, which aligns with Assembly Bill (AB) 802,²¹ with California Energy Commission (CEC) benchmarking regulations, and with Public Resource Code §25402.10²² which requires utilities to maintain records of the energy consumption data of all nonresidential buildings. In compliance with AB 802, SCE's Automated Benchmarking System (ABS) supports customer benchmarking data requests. AB 802 is an energy benchmarking and public disclosure regulation for commercial and multifamily buildings that meet certain criteria (building size, type, etc.). It requires owners of affected buildings to report energy usage data to the CEC. SCE's ABS system was developed to intake customer data requests and deliver the data to the Environmental Protection Agency's ENERGYSTAR[®] Portfolio Manager (ESPM) system, which allows the building owners to receive the usage data from SCE and submit reports to the CEC.

Benchmarking Activity 2023

The CEC implemented a proactive approach by mailing letters to building owners whose properties exceeded 50,000 square feet. The goal was to ensure compliance with the Building Energy Benchmarking Program, which requires annual reporting of energy consumption by June 1. These letters served to notify owners of their obligation to submit energy usage data for their buildings.

Benchmarking activities and supporting efforts in 2023 included:

²¹ AB 802, California Code of Regulations, Title 20. Public Utilities and Energy, Division 2. State Energy Resources Conservation and Development Commission, Chapter 4. Energy Conservation, Article 9. Building Energy Use Data Access, Benchmarking, and Public Disclosure.

²² California Public Resources Code § 25402.10 (Chapter 5, Energy Resources Conservation).

- Fulfilling customer data requests for approximately 9,000 active buildings through the Automated Benchmarking System (ABS), a 23% increase over 2022
- Successfully providing aggregated whole-building usage data from Program Year 2022 for compliance with AB 802. (Due to an increase in requests for technical assistance to comply with benchmarking requirements, the CEC extended the reporting deadline from June 1 to July 1, 2023), and
- Supporting the latest version of the ENERGYSTAR[®] Portfolio Manager Application Programming Interface (API).

SCE also provided the CEC the aggregated whole-building energy usage during Program Year 2022 for 24 SCE-owned buildings that are 50,000 sq. ft. and larger.

California Statewide Lighting Program

Program Description

The California Statewide Lighting (SWL) Program a midstream program implemented by TRC Solutions, served all eligible electric customers in the participating IOUs' service areas: Southern California Edison (SCE), San Diego Gas & Electric (SDG&E), and Pacific Gas & Electric (PG&E). The Program aimed to promote the sale and installation of high-efficiency light-emitting diode (LED) lighting products through midstream channels for nonresidential (Commercial & Industrial) market sectors throughout the IOUs' service areas.

Program Activity in 2023

During 2023, TRC Solutions encountered challenges in operating the SWL program, including inventory, significant measure eligibility and value changes, workpaper documentation requirements, and customer volume. Because of these challenges, SCE and TRC Solutions mutually agreed to close the program in 2023. SCE actively collaborated with the implementer to obtain the required documentation to close all open projects. In June 2023, the CPUC approved closure of the SWL program through SCE's 2024-2027 EE Business Plan Application filing. SCE hosted a Public Webinar after notifying the appropriate service lists and in July 2023, the program was closed. Thereafter, SCE returned collected program performance assurance funds²³ to the energy efficiency portfolio budget as directed by the Commission in D.23-02-002.²⁴

²³ See *Appendix A, Section 4: Expenditures and Cost Effectiveness*, below.

²⁴ D.18-05-041, *Decision Addressing Energy Efficiency Third-Party Processes and Other Issues*, OP 3.

Willdan Commercial Energy Efficiency Program

Program Description

The Willdan Commercial Energy Efficiency Program (CEEP) is a comprehensive program that utilizes a downstream delivery methodology and is offered only to commercial SCE customers. Deemed, Custom Calculated, and Normalized Meter Energy Consumption (NMEC) measures are offered to commercial business customers that identify under the following North American Industry Classification System (NAICS) codes segments: Lodging, Restaurants, Grocery Stores, Warehouses, Refrigerated Warehouses, Retail, Technology, Offices, and Miscellaneous.

Strategies Implemented in 2023

The CEEP continued to deliver energy savings throughout 2023. The program continued its development of checklists for Deemed Measure Packages and began publishing them for the implementer on SCE's Trade Ally Connect website. SCE developed the program's Performance Scorecard Report, shared monthly with the implementer, to review key metrics and collaborate on how program performance may be enhanced. SCE processed system enhancements which were developed and implemented throughout 2023 to increase the program's efficiency in processing, tracking, revising, reviewing, and approving more than 800 projects.

In February of 2023, the CPUC approved AL 4937-E²⁵ effective January 1, 2023, regarding an amendment that updated targeted savings values for 2023. SCE and Willdan took a collaborative approach to improve performance throughout the year which included weekly operational meetings and improved forecasting. This resulted in additional savings being delivered to the program. Following CPUC approval of AL 5129-E,²⁶ effective November 30, 2023, the program delivered 160% of the program's 2023 energy savings goal.

Both the Deemed and Calculated processes for project submission, quality assurance (QA) review, and approval continued to be streamlined in 2023. The year-end energy savings total was approximately 67 million net kWh and 1,000 net kW, achieved through over 800 projects, over 95% of which were Deemed. The Deemed measure types were Refrigeration (14%), Lighting (5%), and Heat Pump Water Heaters (82%).

Market Access Program

Program Description

SCE's Market Access Program (MAP), marketed to the public as a Summer Reliability Program (SRP), offers participants performance-based compensation to reduce

²⁵ AL 4937-E: *Request for Approval of Amendment No. 3 to Residential, Commercial, and Industrial Energy Efficiency Third Party Contract for Comprehensive Commercial Program* (Jan. 3, 2023)

²⁶ AL 5129-E: *Request for Approval of Amendment No. 5 to Residential, Commercial, and Industrial Energy Efficiency Third Party Contract for Comprehensive Commercial Program* (Oct. 30, 2023)

energy usage during times of high grid stress, with the goal of avoiding rotating outages while minimizing costs to ratepayers. The program assisted both commercial and residential customers to purchase and install EE measures to reduce electricity demand for the 2022 and 2023 summers. The CPUC extended the program through March 2024 to provide additional demand reduction.

The Program focused on peak energy reduction that qualifying vendors, or Trade Professionals, which help customers participate in energy efficiency programs. These Trade Professionals directly recruit and engage with targeted customer segments that demonstrate high peak energy usage for a select group of measures.

Strategies Implemented in 2023

For information about MAP activities in 2023, please see *Chapter 1, Residential Sector Energy Efficiency Programs*, above.

ICF Commercial Behavioral Program

Program Description

The Commercial Behavioral Program promotes adoption of behavioral changes in small and mid-size commercial customers through personalized Business Energy Reports (BERs), Energy Advisor support, and rewards. The program Measure Package (workpaper) for BERs was approved in early 2023. Once launched, the program will deliver BERs to an initial treatment group of 80,000 small and medium business (SMB) customers across SCE's service area. These customers will receive customized bi-monthly BERs delivered through paper and e-mail channels, giving them feedback on their energy usage and recommending low-cost or no-cost ways to save energy.

Additionally, the program will involve a targeted outbound coaching campaign by Energy Advisors. This campaign will serve to reinforce the BERs through data-driven conversations with SCE's customers about their lighting, HVAC, refrigeration, office equipment, cooking, water heating, and other business-related electric end-uses. The program will also include a rewards component to motivate action to drive business energy savings.

The Commercial Behavioral Program implementer is ICF Resources.

Strategies Implemented in 2023

In 2023, the program focused on:

- Conducting necessary ramp-up activities to prepare BERs for launch to SMB customers in 2024, and
- Completing the IT secure data transfer project from SCE to ICF to facilitate the analysis, launch, and implementation of the program.

Closed Commercial Sector Programs

Commercial Calculated Energy Efficiency Program

The Commercial Calculated Energy Efficiency Program (also known as Customized Retrofit Offering Program) offered incentives for customized retrofit and BRO (Behavioral, Retrocommissioning and Operational)²⁷ EE projects.

The program was closed to new applications on December 31, 2021.²⁸ The program completed four projects in 2023, and 19 unfinished projects remained at the end of 2023.

Savings By Design Program

The Savings By Design (SBD) program was a statewide nonresidential new construction program that provided technical design assistance and financial incentives to influence and encourage facility owners, design teams, and builders to integrate energy-efficient technologies into their building design and construction practices.

SBD closed to new enrollments on March 31, 2021.²⁹ The program completed three projects in 2023, with six unfinished projects remaining at the end of 2023.

Enhanced Retro-Commissioning Program

The primary objective of the Enhanced Retro-Commissioning Program was to provide comprehensive integrated demand-side management (IDSM) solutions for customers by using advanced analytic tools to identify retro-commissioning opportunities in complex buildings, including large commercial offices, hospitals, and resorts.

The Program was closed to new applications on December 31, 2019, per Advice Letter 4068-E,³⁰ filed September 3, 2019. The program completed two projects in 2023, and there were no remaining projects at the end of the year.

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²⁷ Formerly known as Retro-commissioning (RCx).

²⁸ AL 4633-E-A, *Southern California Edison Company's Energy Efficiency Program and Portfolio Annual Budget Advice Letter for Program Years 2022 and 2023*.

²⁹ AL 4285-E-A, *Southern California Edison Company's Energy Efficiency Program and Portfolio Annual budget Advice Letter for Program Year 2021*.

³⁰ AL 4086-E, *Energy Data Request Programs Quarterly Report for Third Quarter 2019 in Compliance with D.14-05-016*

3. Industrial Sector Energy Efficiency Programs

SCE's Industrial sector Energy Efficiency (EE) programs work with industry stakeholders to promote integrated energy management solutions to industrial end-use customers, such as printing plants, petroleum refineries, chemical industries, and water and wastewater treatment plants. The programs are designed to overcome the traditional market barriers to energy efficiency while also advancing distributed generation (DG) and demand response (DR) opportunities.³¹

The Industrial program portfolio includes:

- Strategic Energy Management Program
- Willdan Industrial Energy Efficiency Program, and
- California Statewide Lighting Program.

In 2022, SCE received CPUC approval to close the Industrial Energy Advisor Program. In addition, the SCE-implemented Industrial Calculated Energy Efficiency Program and the following five local third party-implemented programs were closed to new applications, but were still completing committed projects in 2023:

- Primary and Fabricated Metals Program
- Nonmetallic Minerals and Products Program
- Comprehensive Chemical Products Program
- Comprehensive Petroleum Refining Program, and
- Midsize Industrial Customer EE (MICE) Program.

Strategic Energy Management (SEM) Program

Program Description

The Industrial SEM Program is a multi-year approach, beginning with a two-year commitment period with the potential for additional renewal periods. It is a whole-facility program that addresses all types of resource (electric and natural gas) usage reduction opportunities in a comprehensive manner within industrial facilities.

Energy savings opportunities in the SEM program include low-cost behavioral, retro-commissioning, and operational (BRO) measures and capital projects. The program measures savings at the meter level, using a normalized regression model that accounts for factors such as production volume and weather which affect energy consumption. Customers receive incentives for BRO measures, for capital projects, and for achieving key milestones. The SEM Program complies with the *California Industrial SEM Design Guide* and the

³¹ Program budgets and forecast comparisons are available at [2023 SCE Budget Filing Dashboard - CEDARS \(sound-data.com\)](https://www.sce.com/budget-filing).

California Industrial SEM Measurement and Verification (M&V) Guide (updated in 2020), which have been accepted by the CPUC.

The Program has served and continues to serve customers in the following industry segments ("verticals"):

- Aerospace
- Beverages
- Cement
- Construction Materials
- Food Processing
- Industrial Gases
- Metal Processing
- Metal Smelting
- Plastic Formation
- Plastic Manufacturing
- Packaging Manufacturing (cardboard, paper, plastic and Styrofoam)
- Mineral Processing, and
- Water Distribution

Strategies Implemented in 2023

Program Successes

The program exceeded expectations, resulting in net energy savings of approximately 23 GWh and demand reduction of 2.7 MW.

- Positive performance in kWh savings and incentives are some of the main drivers keeping customers participating in the next cycles of their respective cohorts.
- The program does not only focus on projects, but also helps customers learn best practices for energy efficiency.

Since this program has exceeded expectations, in 2024 SCE plans to offer SEM to customers in the commercial and agricultural sectors.

Willdan Industrial Energy Efficiency Program

Program Description

The Willdan Industrial Energy Efficiency Program (IEEP) is a comprehensive offering for industrial SCE customers, utilizing a downstream delivery methodology. Deemed, Calculated (customized), and Normalized Meter Energy Consumption (NMEC) measures are offered to industrial business customers that identify under the following NAICS code segments:

- Mining

- Utilities
- Construction
- Manufacturing
- Wholesale trade
- Transportation, and
- Other services

Strategies Implemented in 2023

During 2023, SCE and the Industrial Energy Efficiency program implementer experienced challenges related to increased costs of reaching and serving industrial customers and other factors. As a result, SCE spent most of the year identifying projects to transfer out of the program and reconcile projects that were in the pipeline without adding additional project commitments. By the end of the year, the implementer provided the necessary documentation for 31 projects, which resulted in more than 1.4 GWh and less than 1 MW of claimable energy and demand savings for 2023.

SCE demonstrated its commitment to the success of this program by working closely with the implementer throughout the contract. However, SCE and Willdan ultimately decided to close the program in 2024. The program funds are to be reallocated to areas within SCE's portfolio that are more cost-effective.

California Statewide Lighting Program

Program Description

The California Statewide Lighting (SWL) Program, implemented by TRC Solutions, served all eligible electric customers in the service areas of the participating electric IOUs: SCE, SDG&E, and PG&E. The Program aimed to promote the sale and installation of high-efficiency LED lighting products through midstream channels for the Commercial and Industrial market sectors.

Strategies Implemented in 2023

For information about SWL activities in 2023, please see *Chapter 2, Commercial Sector Energy Efficiency Programs*, above.

Closed SCE-Implemented Industrial Sector Programs

Industrial Calculated Energy Efficiency Program

The Industrial Calculated Energy Efficiency Program offered incentives for customized retrofit and Behavioral, Retrocommissioning and Operational (BRO) energy efficiency projects.

The Industrial Calculated Program is closed, and all projects were completed by end of 2023.

Closed Local Third Party-Implemented Industrial Sector Programs

Primary and Fabricated Metals Program

The Primary and Fabricated Metals Program targeted qualifying customer businesses and facilities in the fabricated metals and industrial gas manufacturing industries within SCE's service area.

In Advice Letter 4633-E,³² SCE requested a small increase to the program's budget for final project and program closure activities. During 2023, the Program continued to complete committed projects.

This program completed two projects in 2023 and has one more project in the pipeline expected to be completed in 2024.

Nonmetallic Minerals and Products Program

The Nonmetallic Minerals and Products Program provided a cost-effective process for improving the energy efficiency of large industrial customers, such as cement production plants and other non-metallic mineral miners or processors, aerospace and other transportation vehicle manufacturing, and wood and paper manufacturing.

The Program was closed to new applications on December 31, 2020, per Advice Letter 4285-E-A, filed November 20, 2020. In Advice Letter 4633-E, filed November 8, 2021, SCE requested a small increase to this program's budget for final project and program closure activities.

The Program completed one project in 2023 and has one more project in the pipeline expected to be completed and paid in 2024.

Comprehensive Petroleum Refining Program

The Comprehensive Petroleum Refining Program targeted all the major petroleum refineries and petroleum product manufacturers in SCE's service area to produce long-term, cost-effective electrical energy savings.

The program was closed to new applications on December 31, 2020, per Advice Letter (AL) 4285-E-A. In Advice Letter 4633-E, SCE requested a small increase to the program's budget for final project and program closure activities.

³² AL 4633-E, *Southern California Edison Company's Energy Efficiency Program and Portfolio Annual Budget Advice Letter for Program Years 2022 and 2023*.

The program completed three projects in 2023 and has one more project in the pipeline, expected to be completed in 2024.

Midsize Industrial Customer EE (MICE) Program

The Midsize Industrial Customer Energy Efficiency (MICE) Program provided in-depth energy assessment services to medium-size industrial customers to identify measures and projects that customers may not otherwise implement.

In Advice Letter 3859-E,³³ filed on September 4, 2018, SCE requested CPUC approval to close the Midsize Industrial Customer EE (MICE) Program after any existing commitments were completed, effective December 31, 2018. Upon CPUC approval, the Program closed to new applications but will continue operations until projects in the pipeline are completed.

This program completed three projects in 2023, and there were no remaining projects at the end of the year.

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³³ AL 3859-E, *SCE 2019 EE Program and Portfolio Annual Budget Advice Letter*.

4. Agriculture Sector Energy Efficiency Programs

SCE's Agriculture Sector Energy Efficiency (EE) programs³⁴ offer solutions to help agricultural customers save money and energy, including technical support (facility audits, calculation and design assistance, and pump tests), and financial support through calculated and deemed incentives and rebates. Targeted segments include dairies, farms, food processing facilities, and water pumping facilities.

The Agriculture Energy Efficiency (AgEE) Program is a new program offered in the agricultural sector, implemented by ICF Resources, LLC. This program succeeds two SCE-implemented programs closed in 2022:

- Agriculture Calculated Energy Efficiency Program, and
- Agriculture Deemed Energy Efficiency Program.

ICF Agriculture Energy Efficiency Program

The ICF Agriculture Energy Efficiency (AgEE) Program is intended to serve SCE's agricultural customers by cost-effectively delivering relevant EE solutions that meet the diverse needs of the agriculture sector. The program's objective is to increase customer participation and achieve greater savings within the sector through customized solution sets that provide quantifiable operating cost reductions.

The AgEE Program identifies and works with agriculture customers to help them understand the benefits of implementing energy-saving projects and measures, provides technical and project development assistance as needed, and leverages financing solutions such as On-Bill Financing (OBF). For Disadvantaged Communities (DAC) and Hard-to-Reach (HTR) customers, the program provides higher levels of incentives and technical support to overcome participation barriers.

Program Activity in 2023

ICF Resources LLC began implementing the AgEE Program in the Fourth Quarter of 2021. For the 2023 program year, ICF provided projects delivering approximately 800,000 energy savings (kWh).

ICF completed numerous installations of variable frequency drives on agricultural well pumps and booster pumps. They also completed several larger, more efficient agricultural ventilation fan projects that utilize variable-frequency drives (VFDs) to make them even more efficient.

³⁴ Program budgets and forecast comparisons are available at [2023 SCE Budget Filing Dashboard - CEDARS \(sound-data.com\)](#).

Closed Agriculture Sector Programs

Agriculture Calculated Energy Efficiency Program

The Agriculture Calculated Energy Efficiency Program offered incentives for customized EE retrofit and Behavioral, Retrocommissioning and Operational (BRO) projects for agricultural customers.

In Advice Letter AL 4633-E-A,³⁵ filed on January 7, 2022, SCE requested CPUC approval to close the Agriculture Calculated Program and to continue managing approved projects in the pipeline until all are completed, some of which remained open at the end of 2023.

Agriculture Deemed Energy Efficiency Program

The Agriculture Deemed Energy Efficiency Program offered eligible agricultural customers incentives that encouraged common, standardized EE equipment retrofits.

In Advice Letter AL 4633-E-A, SCE also requested CPUC approval to immediately close the Agriculture Deemed EE Program.

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³⁵ AL 4633-E-A, *Supplement to Advice 4633-E, Southern California Edison Company's Energy Efficiency Program and Portfolio Annual Budget Advice Letter for Program Years 2022 and 2023.*

5. Public Sector Energy Efficiency Programs

SCE's portfolio of Public Sector Energy Efficiency (EE) programs includes:³⁶

- The CATALENA Project
- Lincus Statewide Water Infrastructure & System Efficiency (SW WISETM)
- CLEAResult Statewide Higher Education EE Program (HEEP)
- CLEAResult Public Energy Performance (PEP) Program, and
- Three Regional Energy Network (REN) Fiscal Oversight Partnerships:
 - Southern California Regional Energy Network (SoCalREN),
 - Inland Regional Energy Network (IREN), and
 - Tri-County REN Regional Energy Network (3C-REN).

In 2023, SCE continued to complete committed projects for programs that were closed to new applications in or before 2023. These programs are as follows:

- City of Long Beach Energy Leader Partnership
- Gateway Cities Energy Leader Partnership
- Orange County Cities Energy Leader Partnership
- San Gabriel Valley Energy Leader Partnership
- South Bay Energy Leader Partnership
- South Santa Barbara County Energy Leader Partnership
- Ventura County Energy Leader Partnership
- West Side Energy Leader Partnership
- County of Los Angeles Energy Efficiency Partnership
- California Community Colleges (CCC)
- University of California / California State Universities (UC / CSU) Energy Efficiency Partnership
- Public Sector Performance-Based Retrofit Program (PSPBR), and
- Water Infrastructure System Efficiency (WISETM) Program.

California Analysis Tool for Locational Energy Assessment (CATALENA) Project

Project Description

In D.18-05-041,³⁷ the Commission directed the IOU Program Administrators³⁸ (PAs) to select a lead to oversee the statewide deployment of the California Analysis Tool for

³⁶ Program budgets and forecast comparisons are available at [2023 SCE Budget Filing Dashboard - CEDARS \(sound-data.com\)](#).

³⁷ D.18-05-041, *Addressing Energy Efficiency Business Plans*.

³⁸ SCE, Pacific Gas & Electric (PG&E) Company, San Diego Gas & Electric (SDG&E) Company, and Southern California Gas (SoCalGas) Company.

Locational Energy Assessment (CATALENA) and competitively solicit a third party.

In D.23-02-002, the Commission "reassigned responsibility for the deployment and ongoing management of the CATALENA tool"³⁹ to the CEC, relieving the IOUs of the requirement to "competitively solicit an implementer for the CATALENA tool."⁴⁰ The Decision also directed the IOUs to allocate "\$2 million specified in D.18-05-041 to a new accounting mechanism for the purpose of transferring those funds to the CEC to develop and maintain the tool."⁴¹ On April 3, 2023, PG&E filed an advice letter on behalf of SCE, SDG&E and SCG (joint utilities) confirming "that each of the IOUs has complied with D.23-02-002 by establishing an accounting mechanism for tracking and managing that IOU's share of the \$2 million total authorized budget."⁴²

Also, in D.23-02-002, the Commission set a 120-day deadline for the IOUs to transfer initial provision of customer-level distributed energy resources (DER) program data to the CEC in support of the CATALENA tool. Commission staff provided the joint IOUs with draft data specifications on May 5, 2023; however, IOU staff cannot begin to gather and prepare data until the specifications are finalized. The volume of customer-level participation data for DER programs is significant and will require extensive data compiling, testing and migration. As a result, the IOUs could not meet the June 5, 2023, deadline and PG&E filed an extension request on behalf of the joint IOUs on May 26, 2023, extending the due date to October 3, 2023. A second extension request was submitted by PG&E on behalf of the joint IOUs on September 20, 2023, and was granted on October 3, 2023, extending the deadline for this requirement to "90 days after Commission staff provides the joint IOUs with final data specification."⁴³

Regional Energy Network Partnerships

Note: See also Appendix D, *Regional Energy Networks: Joint Cooperation Memoranda*.

D.23-06-055⁴⁴ supersedes D.18-05-041 and D.21-05-031 with respect to the timing and submission of Joint Cooperation Memoranda (JCM). Portfolio administrators must submit JCMs every two years, within 60 days after Commission approval of the last of each JCM portfolio administrator's true-up advice letters and mid-cycle advice letters (as applicable), to the California Energy Data and Reporting System (CEDARS), with notice to the service list of Rulemaking (R.)13-11-005 or a successor proceeding.

Regional Energy Networks (RENs) began consulting with SCE on requesting disaggregated data as ordered in D.23-02-002, OP 19.

³⁹ D.23-02-002, p. 59.

⁴⁰ *Id.*

⁴¹ *Id.* at p. 60.

⁴² PG&E AL 4734-G/6904-E, SDG&E 4197-E/3184-G, SCG 6121-G, SCE 5005-E, p.2

⁴³ Letter from Executive Director Rachel Peterson dated October 3, 2023, approving extension request

⁴⁴ D.23-06-055, *Decision Authorizing Energy Efficiency Portfolios for 2024-2027 and Business Plans for 2024-2031*.

Southern California Regional Energy Network Fiscal Oversight

Program Description

On June 6, 2018, the CPUC approved SCE's 2018-2025 Energy Efficiency Rolling Portfolio Business Plan.⁴⁵ In December 2019, the CPUC issued D.19-12-021,⁴⁶ removing the pilot status of SoCalREN and authorizing the continuation of SoCalREN through the end of the business plan period.

A joint agreement between SCE, the Southern California Gas Company (SoCalGas), and SoCalREN, with SoCalGas as the lead administrator, describes the SoCalREN Partnership, through which the IOUs provide fiscal oversight for the programs but do not directly manage them.

Program Activities in 2023

SoCalREN, in cooperation with SCE and CLEAResult, held several coordination meetings for the SoCalREN Public Delivery Program and the CLEAResult Public Energy Performance program. The meetings focused on coordination protocols to avoid customer confusion and to deliver the best program offerings for the customer.

Tri-County Regional Energy Network Fiscal Oversight

Program Description

The Tri-County Regional Energy Network (3C-REN), jointly administered by San Luis Obispo, Santa Barbara, and Ventura Counties, was approved as a pilot in D.18-05-041.

A joint agreement between PG&E, SCE, SoCalGas, and 3C-REN, with SoCalGas as the lead administrator, defines the 3C-REN Partnership, through which the IOUs provide fiscal oversight for the programs but do not directly manage them.

Program Activities in 2023

- 3C-REN began consulting with SCE on requesting disaggregated data as ordered in D.23-02-002, OP 19.
- SCE began assessing 3C-REN's cybersecurity capabilities and discussing non-disclosure agreements.
- 3C-REN, SCG, and SCE amended the funding agreement to discontinue the three-party co-funding agreement by Q2 of 2024 and changes the direct funds disbursement process from 2024 onward, per D.23-06-055.

⁴⁵ D.18-05-041, *Decision Addressing Energy Efficiency Business Plans*.

⁴⁶ D.19-12-021, *Decision Regarding Frameworks for Energy Efficiency Regional Energy Networks and Market Transformation*.

Inland Regional Energy Network

Program Description

The Inland Regional Energy Network (I-REN), jointly administered by the Western Riverside Council of Governments (WRCOG), Coachella Valley Association of Governments (CVAG), and San Bernardino Association of Governments (SANBAG), was approved in D.18-05-041 (cited above).

In 2022, a joint agreement between SCE, SoCalGas, and I-REN, with SoCalGas as the lead administrator, defines the I-REN Partnership, through which the IOUs provide fiscal oversight for the programs but do not directly manage them.

Program Activity in 2023

- SCE continued to work cooperatively with SoCalGas and I-REN to develop the I-REN agreement.
- I-REN began consulting with SCE on requesting disaggregated data as ordered in D.23-02-002. SCE started the process of assessing I-REN's security capabilities and discussing non-disclosure agreements.
- I-REN, SCG, and SCE completed an amendment to the funding agreement that discontinues the three-party co-funding agreement by Q2 of 2024 and changes the direct funds disbursement process from 2024 onwards, per D.23-06-055.

Lincus Statewide Water Infrastructure & System Efficiency (SW WISE™) Program

Program Description

The Statewide Water Infrastructure and System Efficiency Program (SW WISE™) is a downstream offering within the service areas of PG&E, SCE, SoCalGas, and San Diego Gas & Electric (SDG&E), providing EE solutions to water production, distribution, and water/wastewater treatment systems and oil field clearwater pumping systems. SW WISE™ serves facilities and systems including water agencies, private water companies, wastewater agencies, special districts, joint power authorities, local government agencies, investor-owned water utilities (IOUs), oil field water-pumping customers, and other water-pumping or treatment customers who pay the Public Purpose Programs Charge (PPPC).

The SW WISE™ Program:

- Trains and equips trade allies in the water and wastewater segment to recommend more efficient processes and technologies to their customers and enable project implementation
- Assists qualified customers in installing EE measures

- Provides energy engineering and project support services to qualified customers selected to participate in the program
- Helps secure downstream rebates and incentives for eligible measures
- Focuses on technologies and solutions to meet the Program's target TRC ratio, and
- Delivers demand reductions (kW) and energy savings (kWh and therms).

Engineering services may include:

- Project identification
- Feasibility evaluation
- Recommendations and evaluations of EE measures
- EE post-operations validation, and
- Final verification of realized savings.

Project support includes application processing, project inspections, and payment of incentives.

See also the "legacy" Water Infrastructure System Efficiency (WISETM) Program under Closed Public Sector Programs, below.

Strategies Implemented in 2023

In 2023, Southern California Edison (SCE) achieved significant milestones within the SW WISETM program, including:

- **Amendment and Program Extension:** SCE collaborated with the program's third-party implementer, Lincus, to adjust the program's goals and extend the program duration from December 2025 to December 2027 through an Amendment. This amendment was necessary due to energy savings reductions resulting from the Water Pump Upgrade Measure (SWWP004-2), which were driven by changes in the net-to-gross ratio (from 0.85 to 0.06) in 2022. In addition, the measure mix was updated to ensure program goals were achievable while maintaining Total Resource Cost (TRC) effectiveness.
- **Pump Overhaul Measure (Calculated):** Formerly, all pump overhauls were considered free ridership after a customer completed an overhaul. Through collaboration between SCE's Quality Assurance/Quality Control (QA/QC) team and the Commission, this measure was revised. As a result, the Pump Overhaul measure remains eligible for all customers to support EE improvements.
- **Water Pump Upgrade Measure (Deemed):** The Water Pump Upgrade measure (SWWP004) is a key measure for the program and was originally set to expire at the end of 2023. Working closely with PG&E (the Measure Package or "workpaper" Lead), SCE secured an additional year of eligibility for this measure. In 2024, SCE will continue to collaborate with Lincus to further develop and expand the Measure Package, ensuring sustained impact.

- Ramp-up Activities: The program increased its efforts in both Customized and Deemed measures. Lincus formed an alliance with SCE's Hydraulic Services Team, enhancing support for SCE customers. Additionally, Lincus engaged in a refresher on E-5115 (Program Influence) with SCE's QA/QC team and established a strategic partnership with CLEAResult (sub-contractor) to bolster gas-related efficiency measures (therm savings).
- Lincus completed installations in late 2023. Through 2023, Lincus provided projects delivering approximately 3,790 energy savings (net kWh).

CLEAResult Statewide Higher Education Energy Efficiency Program (HEEP)

Program Description

The CLEAResult Higher Education Efficiency Performance (HEEP) Program combines traditional EE programs that incentivize calculated (customized) and deemed measures and support energy action plan implementation and Strategic Energy Management (SEM). Strategic Energy Management is a holistic, whole-facility approach that uses Normalized Meter Energy Consumption (NMEC) and dynamic baseline models to determine energy savings from all program activity at a facility, including capital projects, custom and deemed retrofits, and behavioral, retro-commissioning, and operations (BRO) projects. The SEM offering for the Higher Education sector, following the *California SEM M&V Guide*,⁴⁷ requires a multiyear customer commitment to participate in multiple cohort-type training workshops, energy analysis, and Measurement and Evaluation (M&V) activities based on characteristics of the facility's specific operations.

The HEEP program targets customers in the Higher Education sector and delivers savings to diverse building types owned by each of the three California Higher Education systems: University of California (UC), California State University (CSU), and the California Community Colleges (CCC).

Program Activity in 2023

In 2023, SCE dedicated significant efforts to address key challenges within the SW HEEP Program. Program highlights include:

SCE collaborated closely with CLEAResult to optimize the program's contract and deliverables. CLEAResult experienced challenges with program implementation during 2023 and the parties began contract amendment discussions.

⁴⁷ California Energy Efficiency/Energy Contracts, available at <https://pda.energydataweb.com/#!/q=strategic%20energy%20management%20design%20guide&searchOn=title>.

- Key Measures (SEM): The program successfully enrolled several Community Colleges in 2023. Notably, CLEAResult submitted mid-year reports for San Mateo County Community College District (CCD) and Chabot Las Positas CCD.
- Ramp-up Activities: The SW HEEP program increased its efforts in SEM enrollments during 2023. CLEAResult established strong relationships with several Community Colleges, UC, and CSU campuses across PG&E, SDG&E, and SCE service territories.

CLEAResult Public Energy Performance (PEP) Program

Program Description

The CLEAResult Public Energy Performance (PEP) Program combines traditional EE programs that incentivize Calculated and Deemed measures with supported energy action plan implementation and Strategic Energy Management (SEM), as described above. The SEM offering for the Public Sector, following the *California SEM M&V Guide*, requires a multi-year customer commitment to participate in multiple cohort-type training workshops, individual or cohort energy analysis site activities, and Measurement and Evaluation (M&V) activities based on the characteristics of the facility's specific operations.

The PEP program targets customers across the Public Sector and delivers savings to diverse building types owned by public and private local education authorities, municipal, county and federal governments, tribal entities, and private universities and trade schools. This program does not include public higher education institutions, state government facilities, or public hospitals.

The program's primary objective is to meet SCE's business plan goals and objectives and achieve significant energy savings and performance through a comprehensive delivery design. An additional objective of the program is to increase participation by identifying and offering technical support to establish a foundation on which to develop capital projects, which will yield deeper savings.

Program Activities in 2023

CLEAResult has been implementing the PEP Program since 2022 but did not begin delivering results until 2023. Given whole-building opportunities that SEM provides, CLEAResult concentrated on customer outreach and site audits during 2022 and much of 2023 to build up and strengthen the program.

- With this focus on development in 2023, CLEAResult found it proved challenging to foster projects that would allow CLEAResult to achieve their contracted (forecasted) kWh and kW goals. Some of the challenges centered around losing customer energy champions, competition in the marketplace, and eligibility.

- With a primary focus on SEM and a reduced interest in Deemed and Custom measures, SCE and CLEAResult began discussions of a contract amendment to modify program goals.

For 2024, CLEAResult will continue to focus on SEM savings, but will also look to integrate Deemed and Custom measures as well.

Closed Public Sector Programs

Local Government Partnerships

SCE's Local Government Partnerships were collaborations with public entities that shaped EE and sustainability at the local, regional, and statewide level. They were the primary delivery channel supporting cities, counties, and other local agencies seeking energy savings and GHG emission reductions on the community scale.

In its 2022-2023 Bi-Annual Budget Advice Letter⁴⁸ (BBAL), SCE requested CPUC approval to close all of SCE's Local Government Partnerships (LGPs) by the end of 2021. A number of these LGPs were completely closed as of December 31, 2021.

However, although the following partnerships are closed to new applications, some still have projects in the pipeline and will not be completely closed until completion of existing commitments.

City of Long Beach Energy Leader Partnership

The City of Long Beach Partnership Program was a local government partnership between SCE and the City of Long Beach. The Partnership worked to raise EE awareness, promote long-term energy reduction goals within municipal building stock, and coordinate with the city to cross-promote residential and business utility EE programs.

The Partnership completed three projects in 2023 and there are no remaining projects.

Gateway Cities Energy Leader Partnership

The Gateway Cities Energy Partnership Program was a local government partnership including the Cities of South Gate, Norwalk, Downey, Lakewood, and Lynwood, along with SCE and SoCalGas.

The Partnership completed four projects in 2023 and there are no remaining projects.

⁴⁸ AL 4633-E, *SCE's Energy Efficiency Program and Portfolio Annual Budget Advice Letter for Program Years 2022 and 2023*, filed 11/8/2021.

Orange County Cities Energy Leader Partnership

The Orange County Cities Energy Leader Partnership included the Cities of Irvine, Costa Mesa, Fountain Valley, Huntington Beach, Newport Beach, Santa Ana, and Westminster, as well as SCE and SoCalGas.

The Partnership did not complete any projects in 2023. There are three remaining projects in 2024.

San Gabriel Valley Energy Leader Partnership

The San Gabriel Valley Energy Leader Partnership was a partnership between SCE and the San Gabriel Valley Council of Governments, including 29 cities of the San Gabriel Valley.

All remaining San Gabriel Valley Partnership projects were withdrawn in 2023, and none were completed.

Ventura County Energy Leader Partnership

The Ventura County Energy Leader Partnerships, also known as the Ventura County Regional Energy Alliance (VCREA), in partnership with SoCalGas and SCE, worked to produce energy savings for public agencies ⁴⁹ throughout Ventura County, including the County of Ventura and the cities of Camarillo, Fillmore, Moorpark, Ojai, Oxnard, Port Hueneme, Santa Paula, Simi Valley, Thousand Oaks, and Ventura.

The Partnership did not complete any projects in 2023. There is one remaining project in 2024.

West Side Community Energy Leader Partnership

The West Side Community Energy Leader Partnership was a local government partnership including SCE and the Cities of Beverly Hills, Culver City, Malibu, Santa Monica, Santa Clarita, and West Hollywood, with The Energy Coalition (TEC) as the implementing vendor.

The Partnership completed one project in 2023. There are no remaining projects.

County of Los Angeles Energy Efficiency Partnership

The County of Los Angeles Partnership supported the energy reduction and environmental initiatives described in the Los Angeles County Energy and Environmental Plan, adopted in 2008, and the objectives of the California Energy Efficiency Strategic Plan (CEESP).

The Partnership completed three projects in 2023. There are no remaining projects.

⁴⁹ That is, city or county governments and any other public sector organizations.

Institutional and Government Energy Efficiency Partnership Program

The Institutional and Government Energy Efficiency Partnership Program (IGPP) was an umbrella program comprised of two (2) remaining subprograms, partnering with:

- California Community Colleges (CCC), and
- California University Systems: University of California (UC) and California State University (CSU).

California Community Colleges Energy Efficiency Partnership

The California Community Colleges/Investor-Owned Utility (CCC/IOU) Energy Efficiency Partnership was a Statewide program to achieve immediate and long-term energy savings and peak demand reduction within California's community college system.

The SCE CCC/IOU Partnership completed one project in 2023. There are five remaining projects in 2024.

University of California/California State Universities (UC/CSU) Energy Efficiency Partnership

The UC/CSU Energy Efficiency Partnership was a unique program that included California's four IOUs and the Los Angeles Department of Water and Power (LADWP), in partnership with the University of California (UC) and the California State University (CSU) systems.

This Partnership completed one project in 2023. There are three remaining projects in 2024.

Public Sector Performance-Based Retrofit Program

The Public Sector Performance-Based Retrofit Program⁵⁰ (PSPBR) was designed to leverage smart meter investments while bringing the benefits of Normalized Metered Energy Consumption (NMEC) to Public Sector buildings.

The PSPBR Program was closed to new enrollments effective December 31, 2021.⁵¹ The Program will continue managing approved projects in the pipeline until all are completed, which is expected to occur no later than December 2025. (The extended time is due to meter-data analyses scheduled to occur at 3-, 12-, and 24-month intervals after each project installation is completed.)

⁵⁰ Approved in AL 3460-E-A, *Supplemental Filing to Advice 3460-E: Submission of High Opportunity Projects and Programs Proposal: Public Sector Performance-Based Retrofit Program*.

⁵¹ AL 4633-E, *Southern California Edison Company's Energy Efficiency Program and Portfolio Annual Budget Advice Letter for Program Years 2022 and 2023*.

Water Infrastructure System Efficiency (WISE™) Program

The Water Infrastructure System Efficiency (WISE™) Program was a demand-side management (DSM) program designed to provide EE solutions to water agencies, special districts, and local government agencies that oversee water and wastewater treatment and pumping facilities and systems.

SCE proposed to close the WISE™ Program to new applications after June 30, 2019, per Advice Letter 4068-E, filed on September 3, 2019. In 2023, the program completed five projects, with twenty-seven unfinished projects remaining at the end of 2023.

See also the *Lincus Statewide Water Infrastructure & System Efficiency (SW WISE™) Program* on Page 34 above. Customers with new water and wastewater treatment and pumping projects will apply to the Lincus program going forward.

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6. Finance Programs

The goal of the Statewide Finance Program is to facilitate the installation of Energy Efficiency (EE) improvements by providing effective solutions that reduce the burden of upfront costs for the improvements. The Statewide Finance Program includes two main subprograms:

- On-Bill Financing (OBF) Program, and
- New Finance Offerings, which includes one program and two pilots.

These programs provide competitive financing solutions to different customer market segments.⁵²

On-Bill Financing (OBF) Program

Program Description

SCE's OBF Program offers zero-interest, no-fee financing for the installation of qualifying EE measures. Loans are available to qualifying nonresidential customers, including commercial, industrial, agricultural, government, and institutional customers, who repay their loan which shows as a line item on their electric bill. The program supports the goals and strategies of the California Energy Efficiency Strategic Plan (CEESP).

To be eligible for OBF, customers were required to participate in one or more SCE-administered EE program, local third party-administered EE program, or statewide third party-implemented EE program. Participation levels in SCE's incentive programs in 2022 and 2023 had a significantly negative impact in the number of OBF loans in 2023. In 2023, OBF-funded loans totaled over \$1.6 million, and SCE received over \$6 million in loan repayments.

Strategies Implemented in 2023

In 2023, SCE continued to redesign the operationalization of OBF after SCE's transition to third-party implementation for EE programs. On August 18, 2023, the CPUC issued Decision (D.)23-08-026⁵³ authorizing the expansion of the OBF and the California Hub for Energy Efficiency Financing (CHEEF) programs to finance clean energy technologies beyond energy efficiency. SCE is currently awaiting authorization from the California Department of Financial Protection and Innovation to allow IOUs to offer On-Bill Financing outside of Energy Efficiency.

⁵² Program budgets and forecast comparisons are available at [2023 SCE Budget Filing Dashboard - CEDARS \(sound-data.com\)](#).

⁵³ D.23-08-026, *Decision on Clean Energy Financing Proposals*.

In 2023, SCE implemented the strategies described below to fulfill CPUC-mandated compliance requirements, reduce program constraints, and expand the potential for OBF financing to better meet customer needs.

Administrative Changes and Administrative Successes

In 2023, SCE's OBF Program:

- Facilitated the submission of OBF applications by Trade Pros and third-party implementers on behalf of customers
- Reinstated the option to allow OBF customers to designate Trade Pros and program implementers as payees for loan proceeds, and
- Implemented strong reporting tools and project management aids to help proactively manage the pipeline of loan applications and improve communications with customers throughout the OBF process.

Marketing and Communications

During 2023, program outreach was channeled through the EE programs supported by OBF. SCE conducted OBF informational and training sessions with program implementers, trade professionals, and customers. In addition, SCE continued to provide program updates and general information through the OBF webpage on SCE.com.

New Finance Offerings

Program Description

In accordance with D.13-09-044,⁵⁴ the IOUs, along with the California Alternative Energy and Advanced Transportation Financing Authority (CAEATFA, a subdivision of the California Treasurer's Office serving as the pilots' Program Administrator), have developed and are continuing to improve statewide financing pilot programs that:

- Offer scalable and leveraged financing products
- Test market incentives for attracting private capital through investment of customer funds, and
- Test whether payment via the utility bill ("on-bill repayment" or OBR) increases debt service performance across market sectors.

The New Finance Offerings include the following programs and pilots:

- Single Family Loan Program with Credit Enhancements,⁵⁵ commercially known as the GoGreen Home Program

⁵⁴ D.13-09-044, *Decision Implementing 2013-2014 Energy Efficiency Financing Pilot Programs*.

⁵⁵ Formerly also called the Residential EE Loan (REEL) Program.

- Small Business OBR Loan/Lease with Credit Enhancements Pilot Program, commercially known as the GoGreen Business Program, and
- Master-Metered Multifamily OBR Pilot Program, commercially known as the GoGreen Multifamily Program.

The New Finance Offerings include various forms of credit enhancements for loans made by participating financial institutions to residential properties and small businesses. The credit enhancements provide additional security to third-party lenders so that they can extend or improve credit terms for loans that are for qualifying EE projects.

Strategies Implemented in 2023

In 2023, SCE worked with CAEATFA and the other IOUs to implement the following strategies for the New Finance Offerings:

Administrative Successes

- D. 23-08-026⁵⁶ authorized CAEATFA to expand the energy-related technology offerings for its CHEEF Pilot Programs. This expansion is still under development through CAEATFA's rulemaking process.
- SCE continued to offer GoGreen Home microloans through SCE's third-party implementer, Enervee, which offers loans under \$5,000 to purchase energy-efficient appliances through the SCE Marketplace platform.
- SCE provided credit enhancements for more than 285 GoGreen Home loans and three GoGreen Business loans in 2023 that totaled over \$6.3 million.

General Marketing Strategies

Riester Advertising Agency led marketing efforts for the GoGreen programs. Part of the new marketing strategy for 2023 included the complete re-design of the GoGreen Financing website. This was a statewide effort among SCE, the other participating IOUs, and CAEATFA, collaborating to launch the new website⁵⁷ and to develop a new statewide marketing campaign that directly complements the new GoGreen Financing message and design.

SCE launched a social media marketing campaign focused on program awareness from August 9 through November 17, 2023, using Riester's marketing assets with excellent results. SCE's campaign resulted in 16,913 total sessions, 14,519 total users, and 23,232 page views.

⁵⁶ D.23-06-023, *Decision on Clean Energy Financing Proposals*, issued Aug. 18, 2023.

⁵⁷ [California Energy Efficiency Loans for Homes & Businesses | Go Green Financing.](#)

Collaboration with Others

SCE continues to collaborate closely with CAEATFA, the other California IOUs, and third-party implementers by providing financial, marketing, and implementation support to the New Finance Offerings. This collaboration includes policy, marketing, and On-Bill Repayment (OBR) system implementation meetings.

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7. Codes and Standards Program

Program Description

The Codes and Standards (C&S) Program includes three Statewide Advocacy subprograms and three "local" subprograms administered by SCE.⁵⁸ The three Statewide Advocacy subprograms are:

- Appliance Standards Advocacy Subprogram
- Building Codes Advocacy Subprogram, and
- National and International Standards Subprogram.

In compliance with the statewide program and outsourcing goals of the California Public Utilities Commission (CPUC), these Advocacy Subprograms transitioned to a Statewide Codes and Standards Advocacy Program, launched in early 2020, for which Pacific Gas & Electric (PG&E) is the lead Program Administrator (PA). These subprograms save energy and reduce GHG emissions on behalf of customers by influencing regulatory bodies such as the California Energy Commission (CEC or "Energy Commission") and the U.S. Department of Energy (DOE) to strengthen existing Energy Efficiency (EE) regulations and develop new EE regulations.

The three local Codes and Standards subprograms administered by SCE are:

- The C&S Compliance Improvement Subprogram provides additional tools, resources, and training for awareness and improved compliance with all-electric options under the 2022 Title 24, Part 6 California Building Code by offering training and webinars.
- The C&S Reach Codes Subprogram continually supports local government reach code activities by developing cost-effectiveness studies and by tracking their activities in addressing climate action plans and adopting reach codes.
- The C&S Planning and Coordination Subprogram, in collaboration with the CPUC and CEC, continually supports coordination across internal and external stakeholders and cross-cutting programs to develop planning efforts aimed at state policy goals and grid integration, including the state's GHG reduction, EE, building decarbonization, flexible demand, renewable energy, energy storage, water efficiency, and clean transportation goals.

These subprograms conduct efforts to increase compliance with existing C&S regulations, to ensure that the State of California realizes the energy savings from new codes and standards, and to support local governments that include reach codes as a climate strategy. They also bring together statewide IOUs and external stakeholders to optimize building decarbonization planning and coordination activities in preparation for future codes.

⁵⁸ Program budgets and forecast comparisons are available at [2023 SCE Budget Filing Dashboard - CEDARS \(sound-data.com\)](#).

SCE, as a non-lead PA for Advocacy, collaborated and coordinated with PG&E by reviewing Codes and Standards Enhancement (CASE) studies and comment letters as requested by PG&E. The local subprograms, Compliance Improvement, Reach Codes, and Planning and Coordination, bring together stakeholders to help achieve the State's ambitious decarbonization and flexible demand goals.

The C&S Program continues to move California toward decarbonized, grid-harmonized buildings, and to drive the adoption of efficient appliances, distributed energy resources, electric vehicles, and load flexibility, consistent with four other major objectives:

- Carbon reduction targets in 2030 that are 40% below 1990 emissions levels^{59, 60}
- A cumulative doubling of statewide EE savings in electricity and natural gas final end-uses by January 1, 2030,⁶¹ to reduce existing building energy usage by 50%
- Near-zero-emission building technologies to significantly reduce greenhouse gas (GHG) emissions from buildings,⁶² in alignment with Executive Order B-55-18,⁶³ to achieve carbon neutrality by 2045, and
- Integration of building assets with flexible demand opportunities.⁶⁴

As a cross-cutting EE program, SCE's C&S Program plans and coordinates with the Emerging Technology Program and other EE programs, the Demand Response Emerging Markets and Technology Program, Transportation Electrification programs, Income Qualified Programs, and SCE's Transmission and Distribution department to optimize collaboration in support of California's ambitious decarbonization and energy goals, while addressing grid harmonization, load and demand flexibility, building resiliency, and preparing for future code changes.

Key Initiatives

Key initiatives of the C&S Program in 2023 included:

- Training, tools, and resources to support compliance with existing and upcoming codes and standards, and various activities further supporting the all-electric compliance path under 2022 Title 24, Part 6.⁶⁵
- Development of new cost-effectiveness studies to support local government reach codes, including tracking local governments' activities in addressing climate

⁵⁹ Assembly Bill (AB) 398, *California Global Warming Solutions Act of 2006*: market-based compliance mechanisms: fire prevention fees: sales and use tax manufacturing exemption.

⁶⁰ Senate Bill (SB) 32, *California Global Warming Solutions Act of 2006*: emissions limit.

⁶¹ SB 350, *Clean Energy and Pollution Reduction Act of 2015*.

⁶² SB 1477, *Low-emissions buildings and sources of heat energy*.

⁶³ *California Executive Order B-55-18 To Achieve Carbon Neutrality* - State of California, September 10, 2018.

⁶⁴ SB 49, *Energy: appliance standards and State Water Project assessment (2019-2020)*, Chapter 697 (Cal. Stat. 2019).

⁶⁵ Building Energy Efficiency Title 24 Standards.

action plans and adopting reach codes by developing and continuously updating a web-based database.

- Long-term planning and coordination activities, including oversight of the California Building Energy Modeling (CalBEM) consortium,⁶⁶ to optimize energy modeling work across California's utilities.
- Coordination of market-readiness activities aimed at preparing specific industries and technologies for future code cycles.

In addition, support continues for the CEC's initiatives to move to a more GHG-based metric that promotes electrification and grid harmonization.

Compliance Improvement Subprogram

Program Description

The Compliance Improvement (CI) Subprogram helps make customers aware of and comply with building and appliance standards and supports local jurisdictions in improving the effectiveness of their energy code compliance review and oversight role. Compliance improvement activities maximize verified, persistent savings from building codes and appliance standards. The CI Subprogram targets market actors throughout the entire compliance chain, providing education, outreach, technical support, and resources to improve compliance with both building standards (Title 24 Part 6) and appliance energy standards (Title 20 and national standards).

2023 Strategies and Successes

Throughout 2023, the CI Subprogram continued to employ a systematic approach to mobilize the market throughout building and appliance efficiency supply chains. The three-pronged performance improvement approach addresses the essential elements of behavior change:

- Training to provide the knowledge and skills needed for compliance
- Outreach to increase awareness and motivation, and
- Tools and resources to empower people to take the desired actions.

The work accomplished in each area reflects specifically what key market actors have indicated they want and need to improve compliance. This was completed in close collaboration with the CEC, reviewing CI's tool development, statewide course materials, fact sheets, and other resources for accuracy before they are released to the public.

⁶⁶ CalBEM's website is available at <https://calbem.ibpsa.us>. See also *Planning and Coordination Subprogram* in this chapter, below.

Education & Training Highlights

The statewide training team continued its educational efforts in an almost exclusively online format, delivering more than 200 live courses to more than 5,800 participants. The program achieved an average knowledge swing of 25% and satisfaction rating of 97%.

New CI courses support the provisions included in the 2022 Title 24 standards,⁶⁷ including:

- Updated versions of several existing "Code Breakers" presentations, which are compact learning seminars for delivery during monthly member meetings of industry associations, to add qualification for "Zero Net Carbon Design" Continuing Education Units (CEUs) that are required of all California registered architects as a condition of their biannual license renewal.
- A course showcasing all-electric multifamily case study buildings, as a companion presentation to the book of case studies⁶⁸ published through subprogram activities early in the year.
- A course titled "Debunking Electrification Myths," aimed at dispelling common misconceptions about heat pump technologies added as prescriptive measures in the 2022 Title 24 standards.
- A hands-on training session for plumbers and HVAC installers to demonstrate features of Heat Pump Water Heaters, including key installation differences, code requirements, and pitfalls to avoid.

The education and training team also:

- Continued delivery of the Plans Examiner and Building Inspector Workshop, the Nonresidential Standards for Architects Workshop, and the EnergyPro software trainings.
- Completed a book of case studies to highlight multifamily all-electric building projects within the state of California, providing detailed energy usage statistics and in-depth interviews with the design teams. Initial research was also begun in preparation for a planned future volume showcasing all-electric primary and secondary school buildings.

Tools and Resources Highlights

- Revamped the "Help Desk" feature of the Energy Code Ace website to better route stakeholder inquiries and code questions for resolution.

⁶⁷ Changes to Title 24 in 2022 are summarized and available at <https://www.dgs.ca.gov/BSC/Resources/2022-Title-24-California-Code-Changes>.

⁶⁸ CalBEM's case study book series is available at <https://calbem.ibpsa.us/resources/case-study-books>.

- Worked with subject matter experts and the CEC to add to the vast library of existing code resources available on the website. Highlights of new resources added in 2023 include:
 - A fact sheet explaining 2022 "Electric Readiness" requirements for most newly constructed residential single-family and multifamily buildings that choose to install gas-fired appliances
 - A Nonresidential Design Review and Commissioning fact sheet
 - A Residential High-Efficacy Lighting fact sheet highlighting key differences and overlap between Title 20 and Title 24, Part 6
 - A fact sheet focusing on Single-family, Multifamily, Hotel and Motel Domestic Water Heating, and
 - Updated Permit Technician checklists for the 2022 Energy Code, a resource aimed to help building departments focus their review on measures specific to their Climate Zone.

In addition to serving as the gateway to training, tools, and resources, the EnergyCodeAce.com website also facilitates communication between industry and Energy Code Ace experts.

Collaboration with Partners

The CI Subprogram continued its emphasis on targeted online education content and outreach, specifically through the Energy Code Ace components of the subprogram (EnergyCodeAce.com, webinars, and online trainings). The CI Subprogram also strengthened strategic partnerships with the following key industry organizations, to provide their members with training and resources targeted specifically to their needs:

- American Institute of Architects (AIA)
- California Building Officials (CALBO)
- California Association of Building Energy Consultants (CABEC)
- Regional Energy Networks (RENS)
- US Green Building Council (USGBC)
- International Code Council (ICC)
- California Retailers Association (CRA), and
- Passive House California (PHCA).

As part of these efforts, the CI Subprogram:

- Supported AIA California's Climate Action efforts, contributing resource links and information for its microsite and developing and administering quarterly webinars
- Supported the local ICC chapters by providing educational sessions during their annual "Inspection Matrix" all-day training event, and

- Supported local AIA chapters by sponsoring project awards that specifically recognized exemplary projects pursuing energy-efficient, low-carbon designs.

At the request of the CEC, and in collaboration with Sacramento Municipal Utility District (SMUD) and the California Building Industry Association (CBIA), SCE organized and implemented two in-person Heat Pump Forums for builders, architects, and other industry stakeholders to engage with policymakers, manufacturers, and the utilities regarding the prescriptive heat pump provisions in Title 24 Part 6.

The CI Subprogram maintained a strong presence at industry events and conferences, participating as an exhibitor at over 55 events for Energy Code Ace statewide, engaging with over 7,000 people. Participation included session presentations by subject matter experts, distributing job-relevant reference materials specific to the audience, and providing specialists at exhibit booths to answer attendees' code-related questions. Highlights included:

- Sponsoring educational sessions on various code topics during the CABEC conference in October, including a first-hand demonstration of the Virtual Compliance Assistant tool.
- Providing an exhibit booth and distributing net-zero-carbon case study books during the Net Zero Conference in September and at the Southern California Association of Nonprofit Housing Conference in November.
- Engaging realtor and home-builder audiences with new outreach tools at the Pacific Coast Builders' Conference, the California Association of Realtors' RE-Imagine Conference, and the National Association of Realtors' "NAR/NXT Conference."
- Providing an in-person exhibit booth at the CALBO Annual Business Meeting in May and at the CALBO Education Week events in October.

The CI Subprogram expanded its social media presence in 2023, leveraging multiple platforms to increase awareness about available resources, engage with a broader audience, and to drive more traffic to the Energy Code Ace website and available trainings. Content was posted two to three times per week, featuring upcoming events, highlighted education courses, and other notable resources. In 2023, Energy Code Ace Social Media account posts earned over 300,000 post impressions across three platforms.

Measure-Specific Work

The CI Subprogram also continued to support Title 20⁶⁹ compliance in 2022 by targeting key measures,⁷⁰ conducting needs assessments and developing work plans. Key activities included:

⁶⁹ California 2019 Appliance Efficiency Regulations (Title 20, Public Utilities and Energy, Chapter 4, Energy Conservation, Article 4, Appliance Efficiency Regulations), effective 1/1/2020.

⁷⁰ Key measures are defined as those having high savings paired with low compliance, and those that are newly regulated.

- A new fact sheet focused on Evaporative Cooler Regulations
- Online training and a companion fact sheet describing the requirements for products required to be tested, marked and certified to the Modernized Appliance Efficiency Database (MAEDBS) ⁷¹
- A Title 20 fact sheet covering efficiency regulations for Commercial and Industrial Fans and Blowers, and
- An "Equipment Minimum Efficiencies" fact sheet for Residential Space Heating, Cooling, and Water Heating.

Reach Codes Subprogram

Program Description

The C&S Reach Codes (RC) Subprogram provides support to local governments that wish to adopt local energy ordinances ("reach codes") that exceed statewide Title 24 minimum requirements for new buildings, additions, or alterations. Reach code support for local governments includes:

- Conducting research and analysis to establish performance levels and cost effectiveness relative to fundamental Title 24, Part 6 (Energy) and Part 11 (CALGreen) requirements by climate zone
- Drafting model ordinance language to encourage consistency and minimize duplication
- Providing assistance for completing and expediting the application process required for approval by the CEC, the California Building Standards Commission (CBSC), and
- Supporting ordinance implementation once proven effective.

Many local jurisdictions have established goals within their Climate Action Plans to reduce building energy use and GHG emissions by adopting and implementing local energy ordinances. This has translated to unprecedented interest in reach codes as a policy tool to achieve those goals.

Recognizing the high priority to reduce GHG emissions, focus is shifting from solely reducing energy use to reducing carbon emissions associated with energy use. This shift has resulted in increased interest in building electrification, both at the local and state level. The 2022 Standards returned to a single baseline for low rise residential new construction incorporating heat pump equipment into the base design. In addition, the Standards added a third compliance metric, hourly source energy, which functions as a proxy for emissions.

⁷¹ MAEDBS information is available at <https://www.energy.ca.gov/programs-and-topics/programs/appliance-efficiency-program-outreach-and-education/modernized>.

These changes to the state code provide a structure that yields a compliance credit for all-electric projects, creating a path for local jurisdictions to accelerate emissions reductions in new construction.

Most jurisdictions elected to focus on new construction in 2023 with an intent to begin working on ordinances targeting existing buildings. In mid-April, the Ninth Circuit Court issued its ruling in the *Berkeley v. California Restaurant Association (CRA)* lawsuit, determining that the Berkeley 2019 ordinance prohibiting gas infrastructure was preempted by federal regulation (Energy Policy and Conservation Act or EPCA).⁷²

The Berkeley/CRA ruling created a "chilling effect" on reach codes activities that lasted for several months. This uncertainty caused many jurisdictions to "pause" enforcement of all-electric ordinances while awaiting a final resolution. During this time a new ordinance structure was developed that would encourage, but not require all-electric new construction. The Single Margin (aka High Performance) structure highlights the performance of heat pumps, especially with respect to the hourly source energy compliance metric. The structure requires all projects to achieve the same level of performance beyond the base code, an achievement that all-electric designs can accomplish more easily than mixed fuel designs. Four jurisdictions, all of whom used the municipal ordinance structure, officially rescinded their previous ordinances and have adopted new, single margin approaches.

At the local level, most jurisdictions are selecting one or a combination of the following ordinance structures, applied by building use type:

- All-Electric: restricts new construction to all-electric designs only. May be structured as an amendment to Title 24, Part 6 (the Energy Code), or an amendment to a different part of the building code, the health and safety code, or any other municipal code that prohibits new natural gas infrastructure.
- Electric-Preferred: requires mixed-fuel designs to exceed the code and requires all-electric designs to merely comply with the code.
- Electric-Ready: requires mixed-fuel designs to install conduit and wiring to easily enable future conversion to electric equipment.

Some jurisdictions are pursuing measure-based reach codes, such as requiring sustainable or cool roofs or photovoltaic (PV) systems on nonresidential projects, but most are assembling a pro-electrification package targeting the whole building. In addition, many jurisdictions adopted reach codes accelerating the requirements for electric vehicle charging infrastructure in new buildings.

⁷² *California Restaurant Association v. City of Berkeley*. More information is available at <https://climatecasechart.com/case/california-restaurant-association-v-city-of-berkeley/>.

2023 Strategies and Successes

In 2023, throughout California, approximately 10 jurisdictions adopted reach codes and significant progress was made in 2023 with various jurisdictions. Here are some of the highlights in SCE's service territory:

- Two all-electric reach codes were adopted
- Two electric-vehicle and cool-roof reach codes were adopted
- The final Catalina Island Zonal Electrification report for the CPUC was completed, and
- SCE's reach codes webpage was published: [Reach Codes \(sce.com\)](https://www.sce.com/reach-codes).

SCE continued to provide technical support to various municipal jurisdictions, and expanded efforts to support jurisdictions electing to adopt Electric Vehicle reach codes.

Throughout the year, the Reach Codes Subprogram's work to support the jurisdictions pursuing reach codes included analysis and report development, technical support, reach code resource accessibility improvements, and other activities.

Reach Codes Subprogram activities fall into two main categories, with details given below: Direct Technical Support and Resources, Communications, and Events.

Direct Technical Support

Cost-Effectiveness Studies

The IOUs shared resources in 2023 to complete the following studies:

- Multi-Family New Construction
- Alternative Pipe Sizing (Appendix M), and
- Heat Pump Pool Heaters.

The team also initiated three studies supporting the 2022 code cycle:

- Single-Family New Construction Update: Changes include new utility rates and tariffs, revised escalation rate assumptions, the new Net Billing Tariff (NBT), elimination of CPUC subsidies for gas infrastructure, and significant changes to equipment pricing (and availability of supporting data).
- Nonresidential New Construction Update: Limited to Medium Office and Small Hotel Prototypes: Documents results based on new ability to model heat pump boilers in CBECC software.
- Net Billing Tariff (NBT) Impacts on Single Family New Construction: This study documents the impact of the CPUC's change to the PV net billing structure on new single-family homes.

Supporting Documents

In addition to developing new cost-effectiveness reports, the Reach Codes Subprogram, independently and in collaboration with other organizations, supported reach code adoption by creating supplemental support documents. Beginning from a common core helps to support consistent code language across jurisdictions with similar objectives. The RC Subprogram continued partnering with the Building Decarbonization Coalition and Community Choice Aggregators (CCAs) to support jurisdictions through events, resources, and training, while being careful to avoid overlapping efforts.

Cost-Effectiveness (C/E) Explorer

The California Energy Code is complex, and many people responsible for adopting local reach codes do not regularly work with it. In addition, many components of both the economic and technical analyses associated with the California Energy Code may be difficult for a lay person to understand. Although the cost-effectiveness studies sort all data by climate zone, it can still be challenging to identify the appropriate data for an individual jurisdiction. The C/E Explorer simplifies the process, allowing municipal staff to easily select and view only the jurisdiction-specific, relevant results for specific policy options of interest.

The Reach Codes Program expanded C/E tool capabilities, including:

- Making revisions to the tool landing page for a better user experience
- Adding citywide estimates of impact subsidies
- Updating 2022 study data including the addition of hourly source energy
- Creating a new feature to allow users to add ADUs to existing single-family policies, and
- Creating an option to allow users to refine estimates by occupancy type.

Resources, Communications, and Events

LocalEnergyCodes.com Website Refresh

Local interest in reach codes continued to accelerate throughout 2023, fueled by the desire to decarbonize the building sector. As jurisdictions began expanding the scope of ordinances beyond Title 24, Part 6, they sought input from a more diverse community.

- To support improved outreach efforts and remain a trusted resource in this growing area, the RC Subprogram continued to support the LocalEnergyCodes.com website. Throughout the year, the number of site subscribers grew approximately 6% (from 461 to 489 subscribers).
- The RC Subprogram continued to support the Local Ordinance Map, an interactive map of California that allows users to search geographically or by Reach Code Path:

- At the individual jurisdiction level, the map provides a brief summary of an ordinance's scope and requirements, and users may download the ordinance text and the staff report that was presented at the public adoption meeting.
- The map is accompanied by a matrix listing the information contained in the map to allow users to view the information in a different format. This saw an average of 500 downloads per month in 2023.
- In addition to fostering stakeholder engagement through the website, the RC Subprogram continued publishing the *Reach Codes News Brief* monthly newsletter throughout the year. The *News Brief* offers insight into the rapidly evolving reach code landscape and highlights "frontrunner" cities that are leading the way. On average, more than 475 subscribers received the newsletters each month via e-mail.
- The RC Subprogram continues to develop its social media presence and maintains a LinkedIn page and a YouTube channel. The LinkedIn page has 224 followers and began promoting the page more actively in 2023 and tripled its followers.

SCE Reach Codes Website Launch

In 2023 the team continued to direct jurisdictions to SCE's Reach Codes website, which was launched in November 2022. This site provides city and county staff education on reach codes and links to further resources.

Conferences and Events

The RC Subprogram presented and participated in several conferences and held several technical webinars in 2023:

- Monthly reach codes coordination meetings were held, attended by local jurisdictions, regional organizations including Regional Energy Networks (RENs), Community Choice Aggregators (CCAs), and staff from the California Energy Commission (CEC) and the California Air Resources Board (CARB), averaging 41 attendees, approximately 35% more than the 2022 average of 30 attendees.
- In June 2023 the team sponsored the CCEC conference and while in attendance presented on a panel with a few jurisdictions and the Building Decarbonization Coalition.
- In September 2023 the team attended the Zero Carbon Retreat.
- In October 2023 the team attended the California Association of Building Energy Consultants (CABEC) and hosted a Reach Code panel session in collaboration with Frontier Energy.

- The RC Subprogram created a series of Reach Code Newcomers webinars in 2022 which remained popular in 2023. The webinars were viewed on the YouTube channel approximately 120 times in 2023.
- Cross-promotions: The team also promoted webinars, trainings, and conferences hosted by others throughout the year, advertised events in the *Reach Codes News Brief*, posted Energy Updates on the LocalEnergyCodes.com Home page, and advertised more than 60 external events on the LocalEnergyCodes.com Events page.

Planning and Coordination Subprogram

Program Description

California's increasing commitment to energy-efficient building decarbonization, and grid harmonization has resulted in a growing number of state policy goals, expressed in Executive Orders, legislative bills, and state agency action plans. California is currently at the forefront of a fundamental power system transformation toward a cleaner, more diverse "plug and play" grid that integrates an ever-growing set of distributed energy resources and technologies, including demand response (DR), electric vehicle (EV) infrastructure, photovoltaic (PV) systems, and battery and thermal energy storage. Specific emphasis is placed on energy-efficient building decarbonization and grid flexibility, to support the state in achieving its "bold clean energy" goals.

SCE's Planning and Coordination (P&C) Subprogram⁷³ has led the way in meeting California's challenging and urgent decarbonization goals by integrating and coordinating zero-net-emission and all-electric buildings with various programs and grid harmonization activities — including, but not limited to, the Emerging Technologies Program, Energy Efficiency Programs, Income Qualified Programs, Building Electrification Programs, Demand Response, Self-Generation Incentive Programs, Transportation Electrification Programs, and Transmission & Distribution (T&D) planning and forecasting — as envisioned by the CPUC in D.12-05-015.⁷⁴

Since SCE's creation of the California Building Energy Modeling (CalBEM) consortium,⁷⁵ Building Energy Modeling (BEM) coordination has been a key part of the P&C Subprogram that supports four key areas:

- Oversight and financial support for CalBEM
- Code baseline simulation
- Grid impacts simulation, and
- Alternative metrics research.

⁷³ SCE's Planning and Coordination subprogram is similar to PG&E's Code Readiness and Planning and Coordination subprograms combined.

⁷⁴ D.12-05-15, *Decision Providing Guidance on 2013-2014 Energy Efficiency Portfolios and 2012 Marketing, Education, and Outreach*.

⁷⁵ CalBEM's website is available at <https://calbem.ibpsa.us/>.

CalBEM coordinates with the CEC to manage and support updates and changes to Title 24 compliance software (except for CASE-driven compliance support, which is a part of the Statewide Advocacy activities led by PG&E).

The scope of the P&C Subprogram continues to focus support to quantify and understand the grid impacts of existing codes and proposed code changes, and energy-efficient building decarbonization grid harmonization, code harmonization, strategy and planning, and program coordination key initiatives.

2023 Strategies and Successes

The P&C Subprogram has taken a lead role in coordinating the various Codes & Standards-related efforts across the company and stakeholders necessary to support customers and the building industry in effectively meeting the state's energy efficiency, GHG reduction, and grid flexibility goals.

Decarbonization

Building Inventory GIS Database

Since 2022, the Building Inventory Geographic Information System (GIS), aka the BIG Database project, has played a pivotal role in assessing decarbonization opportunities in existing buildings in SCE territory. By collecting the building stock, including factors like vintage, square footage, demographics, climate zone, customer segmentation, and electrical distribution circuit traits, this project laid the groundwork for understanding the complexity in identifying electrification opportunities. Through detailed data collection and analysis, the BIG Database provided insights on potential strategies for promoting energy efficiency and building decarbonization (EEBD), ultimately contributing to a more sustainable and resilient built environment.

- Understanding building vintage is pivotal for discerning the applicable codes during construction and identifying barriers to EEBD adoption. The BIG Database will enable SCE to generate insights to identify barriers to EEBD measure adoption and grid impacts and challenges.
- By integrating insights from other analytical tools like load profile analysis, the BIG Database supports various use cases such as infrastructure assessments, program targeting, and technology evaluation. This initiative addresses the gap between existing building characterization information and EEBD customer targeting needs, ultimately enhancing the efficacy of codes and standards to drive market adoption of energy-efficient decarbonization technologies.
- In 2023, the team completed Phase I and Phase II. Phase II was an expansion from Phase I pilot cities to the Los Angeles and Orange County regions. The database gathered residential and commercial usage data, customer segmentation data, EE measure impacts, on-site generation data, and Distributed Energy Resources Partnership Pilot (DRPEP) circuit data.

- The compilation of these data sources, along with the usage of the Tableau dashboard tool, helped the SCE team use this prototype tool to make early assessments of what the grid impacts will be should certain EE measures be adopted.
- Another important element is the ability to look at the propensity to adopt EVs, solar, batteries, heat pumps, and electric appliances. The tool can also be utilized to determine if customers will participate in flexible load demand programs. This programmable option feature allowed SCE to look at various scenarios and gave early insight on the potential of a completed tool.

BE Project Tracker and California Environmental Quality Act (CEQA) Database

The BE Project Tracker and CEQA Database Project was launched in 2021 as part of a Codes and Standards effort to track large CEQA projects and building electrification projects in SCE's service territory. The first phase of the project has provided SCE an insight on the capabilities of a tracking tool that can inform SCE decision-makers about the grid impacts of large-scale development projects. The prototype tool has sparked discussions on the need for building a more robust tool that can better serve SCE's forecasting needs. In addition, the tool can help provide local cities and jurisdictions information on potential opportunities to expand their electrification efforts.

- The CEQA table currently includes 5,561 recent CEQA projects, and the Building Electrification table contains 1,857 projects. The latter projects are mostly derived from the CEQA projects, but they have been processed, primarily via automated Python scripts, to include additional data such as energy usage estimates.
- The success of the project presented several opportunities for improvement and SCE implemented several measures to streamline this database in 2023.
- In 2023, the team completed the first phase and the second phase will commence in 2024 with additional streamlining of the database architecture and processes. The second phase will also collect land use planning information from specific cities in LA County, Orange County, and San Bernardino County to test and assess enhancements to forecasting capabilities.

Advanced Water Heating Initiative

SCE P&C, a founding member of the Advanced Water Heating Initiative (AWHI), has been a steadfast advocate for the initiative. In 2023, AWHI organized working group meetings attended by nearly 3,000 participants from over 100 organizations. AWHI is committed to unlocking the carbon and energy savings potential of heat pump water heaters (HPWHs). Its mission is to make HPWHs commonplace in every home and business by influencing policies, stimulating demand, introducing products to the market, and educating the supply chain.

- A notable achievement in 2023 was the successful completion of a field evaluation involving 120V HPWHs. In exploring opportunities to retrofit water heaters for electrification, we identified potential barriers such as the need for panel upgrades or dedicated 240V circuits near water heaters. Consequently, SCE's P&C has collaborated with manufacturers and AWHI to introduce 120V heat pump water heaters to the market. A comprehensive field study was conducted in collaboration with HPWH manufacturers, utilities in California, and AWHI.
- This study installed 120V HPWHs in 32 locations across various climate zones in California, monitoring parameters such as water and ambient temperature, power consumption, and user satisfaction. The results indicated high user satisfaction, particularly for households with low to medium hot water demand. Designed to reduce costs and installation complexities, the 120V HPWHs demonstrated significant savings ranging from \$800 to \$15,000 per household compared to their 240V counterparts. With lower amperage draw and substantial energy savings, these units provide a viable alternative.
- The report identifies opportunities in light commercial buildings and emphasizes equity considerations, recommending outreach to low-income communities. It underscores the need for small footprint products, additional research on storage capacity, coordination with Inflation Reduction Act funding, and rate structure reforms to incentivize electrification.
- In conclusion, the report strongly supports the 120V HPWH as a compelling technology for decarbonization in the residential retrofit market and small commercial applications.

Variable Capacity Heat Pumps

P&C assessed the Northeast Energy Efficiency Partnership (NEEP) Cold Climate Air Source Heat Pump (CCASHP) database to identify Variable Capacity Heat Pumps (VCHP) configurations including single-zone, multizone, packaged, ducted, and ductless efficiencies and capacities that are likely to be installed in California single-family and multifamily residential buildings. Performance curves of systems in the database were analyzed to identify representative curves and heat pump products for each VCHP configuration and size. Recommendations for software improvements that make heat pump compliance credits more accessible for residential and multifamily buildings were developed.

Building Electrification Technology Roadmap

K-12 educational institutions hold the potential to reduce carbon emissions generated by their operations, encompassing areas such as water heating, HVAC, buses, and other technologies. In response to this opportunity, SCE's P&C crafted the *Building Electrification Technology Roadmap (BETR) Report*. This comprehensive document is strategically designed to furnish high-level guidance and extensive information for schools and districts undertaking considerations for upgrades to their educational facilities' systems and

equipment. The primary goal of the Report is to provide a roadmap for electrification technologies capable of replacing conventional fuel-fired equipment, such as HVAC and water heating systems often powered by natural gas or propane.

The BETR Report sets out to achieve specific objectives:

- **Guidance for Decision-Making:** Assist schools and districts in making well-informed decisions regarding electrification technologies by presenting a detailed overview of the available options.
- **Cost Analysis:** Conduct a relative cost analysis for the replacement of commonly used equipment in schools, factoring in considerations such as installation challenges, maintenance issues, upfront and operational costs, indoor air quality, and greenhouse gas emissions.
- **Scenario Exploration:** Explore a range of scenarios, including emergency replacements, lifecycle replacements, and planned upgrades or renovations, to address the diverse needs and circumstances of educational facilities.
- **Comparison with Baseline Equipment:** Compare specific electric replacement technologies with baseline equipment to facilitate a clear understanding of the closest like-for-like replacement scenarios.
- **Illustrate Tradeoffs:** Utilize example scenarios to portray the tradeoffs inherent in electrification retrofits, spotlighting specific building types, existing systems, and lifecycle events.
- **Framework for Decision-Making:** Provide a structured framework for schools and districts to consider the most common electrification opportunities, recognizing the unique nature of each project.

Grid Harmonization

In 2023, P&C continued to collaborate with SCE's internal Transmission & Distribution (T&D) planning organization to support the adoption of energy-efficient electrification and demand flexibility technologies. T&D design had to adapt quickly to the market changes driven by recent code changes, such as:

- The 2016 T24 CALGreen requirement for EV charging ports in new construction
- The 2019 T24 inclusion of an all-electric pathway in new construction code, and
- The 2022 T24 "electric-ready" requirement for new homes that went into effect on January 1, 2023. This requirement mandated that new homes have the necessary electrical infrastructure to support future electrification of appliances and equipment that typically use natural gas.

In 2023, P&C led quarterly coordination meetings with T&D stakeholders. This effort resulted in the development and implementation of policies and workstreams to inform T&D planning activities that support reducing electrification readiness barriers. P&C also

continued to coordinate with T&D on initiatives to provide insights into where and when electrification was going to occur and estimate the grid impacts. These initiatives include the BIG Database, BUGMAP, and CEQA Database.

Bottom-Up Grid Model Advanced Profiles (BUGMAP) Tool

In 2023, P&C advanced the development of the Bottom-Up Grid Model Advanced Profiles (BUGMAP) tool, a cutting-edge initiative designed to enhance load forecasting and provide insights into the impacts of electrification on the electrical grid. This proactive approach aims to facilitate the widespread adoption of electrification and the implementation of load control strategies.

- BUGMAP profiling employs a comprehensive methodology to assess the effects of building electrification (BE), transportation electrification (TE), and distributed energy resources (DERs) at both the grid and circuit levels. This process is underpinned by a rigorous load-profiling analysis, which involves the creation of prototypical commercial and residential building energy models. These models integrate data on building characteristics (such as size, age, and equipment) with weather patterns and human behavior to simulate energy usage through physics-based calculations.
- The development of BUGMAP has leveraged a mix of internal and external resources for foundational load profiling. Internally, the team developed a comprehensive database of residential building energy models called the CalBEM Residential Database.⁷⁶ Externally, the team has adopted the Comstock and Resstock models from the National Renewable Energy Laboratory (NREL).
- The BUGMAP profiling process begins with a detailed characterization of customers connected to a specific circuit, differentiating residential customers by home size, age, and climate zone, while commercial profiling is expanded to include building type and usage patterns. Subsequent adjustments simulate various measure adoption scenarios (such as 40% BE adoption), enabling the evaluation of potential grid impacts.
- BUGMAP offers numerous applications, including the planning of incentive programs, evaluation of reach codes, infrastructure assessments, and strategic planning for power service availability. Moving into 2024, P&C is set to continue refining the BUGMAP tool, with a particular emphasis on enhancing commercial modeling capabilities and expanding the range of measure adoption scenarios available for analysis.

Resiliency of Building Electrification

The P&C team continued work on a study that focuses on the resiliency related to building electrification codes and standards. The study:

⁷⁶ Interactive Benchmarking Database, available at <https://calbem-res-benchmarking.com/login>.

- Considers how buildings can provide resiliency for their occupants as buildings transition toward greater levels of electrification.
- Includes the development of a framework for evaluating the costs and benefits of resiliency, and
- Focuses on equity justice issues, examining electrification's potential impact on low-income housing and medically vulnerable customers.

Following Phase I which identified various aspects of building resiliency related to electrification and equity, and Phase II which dove deeper into equity issues and potential resiliency implications for customers, Phase III was initiated which considered the potential opportunities to outreach to customers, communities, and the CEC.

- At the US Green Building Council's 2023 Greenbuild Conference, SCE staff and consultants made a presentation, "The Intersection of Resilient Electrified Buildings and the Grid's Climate Vulnerabilities." This presentation tied the building electrification resiliency study with Edison's "Climate Adaptation and Vulnerability Assessment" and "Adapting for Tomorrow: Powering a Resilient Future" study.

Flexible Load Technical Potential

P&C supported SCE efforts to strategically integrate flexible load as a key element in its climate goals and efforts to balance the evolving electricity supply chain. Aligned with the increased adoption of electrification technologies like electric vehicles (EVs) and heat pumps by SCE customers, the Flexible Load Technical Potential project assesses the impact of these technologies on residential, small commercial, and medium commercial customer load profiles, considering the dynamic changes in the energy landscape.

The California Energy Commission (CEC) actively addresses flexible demand for appliances under Title 20, exploring load-management technology and third-party programs. This study guides technology prioritization by calculating their technical flexible demand capacities.

- Based on publicly available data, the study estimates flexible load potential for SCE in 2022-23, 2030, and 2035. SCE's load profiles, disaggregated using National Renewable Energy Laboratory (NREL) datasets, consider changes in consumer behavior post-COVID. The study illustrates the benefits of electrification leading to higher proportions of flexible loads.
- Incorporating EV load profiles, the analysis projects load growth for 2030 and 2035, aligning SCE forecasts with CEC data. The *Energy + Environmental Economics (E3) Case Study* informs end-use load forecasts, while the overall load forecast aligns with CEC's baseline forecast. The study provides illustrations of 2023 load profiles, modifications for 2030 and 2035, and normalized load profiles with estimated flexible load potential.

- The study estimates that potential for residential flexible loads in the 2035 timeframe starts to look relatively constant, with an average of 16% of the residential load being flexible and a maximum of 18% of the residential load being flexible.
- Key recommendations are:
 - Emerging efficient appliance technologies like heat pumps, which are most efficient running continuously, may not be good candidates for flexible load or demand response.
 - Approaches for managing EV loads including:
 - Dispatching downward adjustments to charging, such as switching from Level 2 to Level 1 charging or from Level 1 charging to no charging
 - Dispatching upward adjustments to charging, such as switching from Level 1 to Level 2 charging or from no charging to Level 1 charging, to utilize excess renewable generation, and
 - Vehicle-to-grid discharging.
 - A flexible demand indicator such as the CEC-developed Market Informed Demand Automation Server (MIDAS) or other price portal that triggers flexible demand (although price indexes like these carry no incentive or price for flexible demand customers to respond).
 - For commercial customers, many buildings have building automation and control systems (BACS) that can be re-commissioned to co-optimize energy usage and energy demand. Typically, a BACS is optimized for minimizing energy usage but does not consider coincident demand. Based on the On-Demand Savings program at Madison Gas & Electric in Wisconsin, there is a 10% average coincident peak demand reduction potential in re-programming or re-commissioning a BACS to co-optimize energy usage and demand.

Strategic Planning and Coordination

Building Energy Modeling (BEM) plays a crucial role in shaping energy design decisions, ensuring energy code compliance, facilitating incentives, and achieving building certifications. Recognizing the importance of statewide coordination for BEM, SCE established CalBEM in 2017 to champion the development of low-carbon buildings across California. This collaborative effort includes a broad range of participants such as utilities, BEM practitioners, building designers, software developers, standards and research organizations, regulatory bodies (including DOE and CEC), municipalities, and advocates for energy simulation. Each participant contributes unique insights, helping to sculpt the BEM landscape in California.

CalBEM achieves its objectives through the concerted efforts of three working groups, each focused on specific areas of BEM. A summary of their key activities in 2023 and plans for 2024 is as follows:

Working Group 1, Streamlining the Building Energy Modeling (BEM) Process

- Prototypes Technical Advisory Group (TAG): A subgroup within Working Group 1, the Prototypes TAG, is dedicated to fostering collaboration with the CPUC, the CEC, and other stakeholders on the development of California building modeling prototypes and related processes. In 2023, the TAG successfully developed a set of proposed residential single-family prototypes, marking significant progress toward standardizing building models in California. In 2024, the focus will shift toward the development of multifamily and commercial prototypes, continuing the effort to streamline BEM processes across various building types.
- Implementation of the California Performance Rating Method (CalPRM): A pivotal project undertaken in 2023 was the implementation of a research version of the Performance Rating Method (PRM) within the California Building Energy Code Compliance Software (CBECC), named CalPRM. This initiative aims to foster discussion on adopting CalPRM as an approved compliance approach in California, by allowing the community to test the research version and compare results with the current performance approach. CalPRM could potentially simplify and enhance the efficiency of code compliance processes.

Working Group 2, Developing BEM Education and Resources

- The group continues to bridge educational gaps within the BEM community in California, emphasizing the importance of a common understanding of BEM roles and applications. Ongoing support for initiatives like *Bemyclopedia* underscores CalBEM's commitment to raising the baseline knowledge of building operation, modeling techniques, and the utilization of model outputs.

Working Group 3, Advancing BEM Capabilities and Metrics

- Efforts in 2023 included projects seeking to improve the Alternative Calculation Method (ACM) Reference Manuals and enhancing the CBECC software. Notable achievements include proposals for integrating digital tools, fostering community engagement in software development, and transitioning to a centralized learning repository for CBECC FAQs. Additionally, an assessment exploring third-party code enforcement mechanisms was initiated, aiming to develop recommendations for implementing such enforcement strategies effectively.

Heat Pump Forums

At the request of the CEC, and in collaboration with SMUD, P&C organized and implemented two Heat Pump Forums for builders, architects, and other industry stakeholders

impacted by the prescriptive heat pump provisions in Title 24 part 6. The intent of the forums was to:

- Bring together policymakers, manufacturers, incentive program administrators, and practitioners to solicit stakeholder feedback
- Present technical findings on the performance of all-electric homes
- Outline the utilities' strategy for accommodating increased building and transportation electrification, and
- Provide insight into the supply strategies of major appliance manufacturers to meet forecast demand for Heat Pump HVAC and Water Heaters.

The Northern California forum was held at the SMUD innovation center in Sacramento on April 6, 2023, and was broadcast online for remote participation, while the Southern California session was hosted at the Newport Beach Civic Center on April 21. Over 200 attendees participated between the two sessions and the online simulcast. Prominent speakers included CEC Commissioner Andrew McAllister, who made a keynote introduction.

Heat Pump Replacement Assessment

P&C assessed residential and non-residential scenarios where heat pump replacements were cost-effective, to establish compliance paths that do not preempt air conditioners or gas equipment with alteration triggers clearly defined. In response to the pro-electrification movement among California jurisdictions, the CEC asked for assistance to assess these voluntary EE measures to support 2025 updates to EE provisions in California Title 24, Part 11 (CALGreen) for alterations in existing buildings. After the studies were evaluated, the CEC decided to move the outcome from Part 11 to Part 6 with results being debuted in the Express Terms. This is currently being reviewed as part of the 2025 code and will be a major step toward addressing building electrification in existing buildings, if approved.

Building Performance Standards Inventory

The P&C team continued work on a scoping study to take inventory of all known Building Performance Standards (BPS) programs in the US, assess their attributes, and help inform their suitability as potential reach codes and statewide policy. BPS are emerging policies that establish specific performance levels existing buildings must achieve. These performance levels may include, but are not limited to, site energy use intensity, building decarbonization, electrification, resilience, and indoor air quality.

- A BPS may be adopted by state or local governments and can be applied to existing commercial and residential buildings. The CEC and many jurisdictions have expressed an interest in adopting BPS as an ordinance, with Chula Vista recently passing such an ordinance. Thus far, multiple state and local governments have passed BPS policies, including Washington, DC, New York

City, St. Louis, MO, and Washington state. The BPS team supported other jurisdictions in California that were developing BPS ordinances including the cities of Santa Monica and West Hollywood.

- SCE staff participated in a presentation panel, "Drivers for Decarbonization: Model Codes, Zero Codes and Building Performance Standards" at the ASHRAE 2023 Decarbonization Conference for the Built Environment. SCE staff presented the "Utility Perspective" of BPS and SCE's role in supporting local jurisdictions and customers implementing BPS, including the Automated Benchmarking System that provides energy use data directly into the ENERGYSTAR[®] Portfolio Manager.

Smart Energy Management Technologies Research

P&C conducted market research and evaluation aimed to assess the market availability, opportunities, barriers, and impacts of smart panel technologies and other smart energy management technologies for residential and small commercial buildings.

The project:

- Conducted market research, stakeholder interviews, and value stream mapping to evaluate the costs, benefits, and code implications of smart panels
- Found that smart panels offer potential advantages for energy efficiency, demand response, and resilience, but also face challenges such as supply chain limitations, cost-effectiveness, and low consumer adoption, and
- Recommended setting up pilot schemes to test and analyze the performance and feasibility of smart panels in different scenarios.

P&C also reviewed existing software tools for simulating smart energy management technologies, especially smart main electrical panels. Nineteen software tools were surveyed and evaluated based on their output types, analytical scope, developer support, gaps and limitations, and applicability for smart panel energy modeling and GHG emissions modeling for buildings and the electrical grid. The review found that:

- Most software tools do not incorporate financial or greenhouse gas impacts
- Models that allow analysis of deferrable loads and diverse human behavior patterns are essential for analyzing the impact of smart panels
- Many software packages that can simulate smart energy management technology are research tools that are no longer maintained by their original developers, and
- EnergyPlus is the best supported tool for highly customizable electric usage patterns and control strategies. Data from software for electrical grid modeling can be used to transform outputs from energy to greenhouse gases and, using Python or Energy Runtime Language, to create customized control strategies for smart panels utilizing building energy management system modeling capabilities.

California's Ambitious Decarbonization Goals

By 2045, the state aims to procure an impressive 100% of its electricity portfolio from eligible renewable energy resources. The Governor of California directed that the California Air Resources Board's 2022 Climate Change Scoping Plan include a goal of three million climate-ready and climate-friendly homes by 2023 and seven million by 2035, supplemented by six million heat pumps to be installed by 2030.

SCE P&C conducted both internal and external engagements in November 2023 to identify key technology, research, projects, and ideas that are important for supporting California's ambitious goals, and how to track our progress by coordinating and collaborating with other market actors, such as national labs, California Air Resources Board (CARB), CEC, Energy Efficiency (EE), Demand Response (DR), CalNEXT, and California Market Transformation Administrator (CalMTA). The external workshop included representatives from the CEC, the National Renewable Energy Laboratory (NREL), and the Pacific Northwest National Laboratory (PNNL), and participants refined a system for communicating "readiness" of these technologies and ideas. Two components of "readiness" were identified, and "readiness levels" were defined within each of these components:

- The first component is Technology Product Readiness, with readiness levels ranging from 1=Research stage to 5=Qualified products list available.
- The second component is Program Readiness, with readiness levels ranging from 1=Idea: Product is identified by utility or agency as being a qualified measure, to 5=Program: Measure approved and marketing, education and outreach activities have been initiated.

The use of consistent, pre-defined readiness levels also facilitates discussion and coordination across different organizations.

Program Coordination

The Emerging Technologies Summit

On August 28-29, 2023, the SCE's Codes and Standards Program, in collaboration with the Emerging Technologies Coordinating Council, orchestrated the ET Summit 2023. During this summit, notable organizations, such as the U.S. Environmental Investigation Agency, Electric Power Research Institute (EPRI), Air-Conditioning, Heating, and Refrigeration Institute (AHRI), and Lawrence Berkeley National Laboratory, presented their efforts in driving market transformation within three pivotal initiatives: distributed energy resources, low-global-warming-potential refrigerants, and commercial water heating.

- The focus of the second day was on the theme "Vision to Accelerate Decarbonization." This segment featured a panel discussion with key figures including CEC Commissioner, Dr. J. Andrew McAllister; Deputy Director of the U.S. Department of Energy's Building Technologies Office, Ram Narayanamurthy; and SCE's Electrification Director, Chanel Parson. They engaged in a dialogue about their organizations' decarbonization goals, provided

updates on progress, and explored strategies for achieving equitable decarbonization.

- The ET Summit 2023, presented as a virtual event, attracted around 300 participants from a diverse array of organizations, including CEC, EPA, California IOUs, CalNEXT, CalMTA, AHRI, EPRI, researchers, environmental advocacy groups, builders, manufacturers, and other professionals.
- After the summit, ETCC agreed to change its name to "Energy Transition Coordinating Council" to better reflect the alignment needs among various actors coordinating and collaborating to meet California's Carbon Neutrality Goal by 2045.

Market Transformation

SCE staff represented the California IOUs on the Market Transformation Advisory Board (MTAB) and participated in several MTAB meetings and coordination meetings with the Codes and Standards Program, Energy Efficiency Programs, and CalNext staffs. The California Market Transformation Program was authorized by CPUC D.19-12-21 and is being administered and implemented by a third party, the California Market Transformation Administrator (CalMTA), under the CPUC's adopted Market Transformation Framework.

- The CalMTA solicited Market Transformation Initiatives (MTI) ideas that resulted in 117 ideas. SCE submitted six ideas but none were selected for the first round.
- After scoring and the ranking by the CalMTA staff, the top three "frontrunner" ideas (portable / window heat pumps, residential induction cooking, and efficient rooftop units) were reviewed by the MTAB members and the public, where many overlaps were found with the Codes and Standards Program.

Electrification Academy

SCE developed an Electrification Academy in anticipation of the increased adoption rates of electrified end-uses. These increases have been driven by the 2022 Title 24 Part 6 California Energy Standards, as well as state and federal rebate and incentive programs.

- The intent of this initiative is to provide foundational knowledge of electrified building technologies for customer-facing, frontline SCE employees, relevant to their specific job function and responsibilities. This will better equip SCE staff to navigate project needs and help customers achieve their electrification and carbon reduction goals in alignment with energy codes and state programs.
- In 2023, SCE deployed the training within the Customer Service Organizational Unit, focused on a combination of online and instructor-led modules organized around Building Electrification Essentials, Residential Electrification, Non-Residential Electrification, and Customer Assistance. Over 1400 Customer Service employees enrolled in the online BE Essentials module and nearly 300 employees completed the live, instructor-led modules.

Architecture at Zero Competition

The Architecture at Zero competition, now in its thirteenth year, was conceived as a response to the Zero Net Energy targets set out by the CPUC in the 2008 report, "California's Long Term Energy Efficiency Strategic Plan." The competition has since evolved beyond the concept of ZNE to investigate how buildings can minimize their GHG emissions impact.

- The design competition focuses on decarbonization, equity and resilience, and is open to students and professionals worldwide. It serves to engage the fields of architecture, design, engineering and planning in the pursuit of sustainable design. The submittal requirements include substantive energy modeling analysis, including Title 24 Part 6 calculations and a narrative on how the project proposal addressed energy code considerations.
- P&C, in partnership with the Workforce Education & Training (WE&T) program and the statewide IOU C&S team, participated in planning, delivering, and evaluating the competition, guiding the technical submission requirements, and providing support to the competition jury in the form of energy metrics review and scoring.
- The 2023 competition challenge was to design an agriculture center, connecting the history of Allensworth, California's first Black town, to its present aspiration to become a destination for sustainable agriculture and Black history. The program included a housing component for farm students on the site. Forty-four complete submissions were received, with ten awards distributed across undergraduate, graduate, and professional categories. Evaluation criteria for the competition included considerations for reductions in embodied carbon.

Equitable Electrification

In 2023 P&C continued tracking SCE program activities that can support equitable electrification. This included transportation electrification (TE) projects that may provide lessons for jurisdictions interested in TE reach code development. P&C participated with the EPRI P204 program, Advanced Buildings and Communities, as co-chair. The program:

- Provides fundamental approaches and practical tools for designing, developing, deploying, integrating, and scaling residential and commercial buildings to support safe, reliable, affordable, and decarbonized buildings and communities in an equitable manner.
- Has three project sets:
 - PS204K: Building Ecosystem Fundamentals and Insights
 - PS204I: Informing Codes, Standards and Policy, and
 - PS204T: Utility Programs and Technology Transfer.
- Has several multiyear projects that are ongoing, many of which are funded by the CEC Electric Program Investment Charge (EPIC) program, including:

- Electrification and decarbonization pathways for residential and commercial buildings, grid-interactive efficient buildings, connected communities, informing codes and standards, programs, and policy.
- Customers' propensity to engage in demand side flexibility,
- Transactive energy
- Price signals
- New construction and retrofit solutions for residential (single and multifamily) and commercial
- Equitable strategies for customer adoption
- Decarbonization approaches and considerations in affordable housing.
- Sustainable building design and construction, and
- Manufactured and modular housing.

Code Harmonization

Embodied Carbon Needs Assessment

When the Embodied Carbon provisions for schools and nonresidential buildings were adopted for CALGreen's July 2024 intervening code cycle, Codes and Standards conducted a needs assessment to inventory the informational materials available to support compliance, identify key stakeholder groups, and determine gaps in training and resource needs for market actors by segment.

- Key findings from the assessment report identified plans examiners, building inspectors, and contractors as key audiences not broadly engaged at present in accounting for and reducing embodied carbon. Many foundational resources about embodied carbon and life-cycle analysis (LCA) exist for architects and specifiers, but checklists are needed to guide a code-compliant workflow, as well as sample documentation demonstrating what submissions to building departments should look like.
- The SCE Codes and Standards team is working with its statewide IOU partners to develop a landing page for key CALGreen provisions as an adjunct to the existing Local Energy Codes website.

CalGreen Coordination

CalGreen, a constituent of Title 24 Part 11, serves as California's comprehensive green building code, emphasizing sustainability, energy efficiency, and the mitigation of environmental impact. Since the integration of "clean air vehicle" parking space regulations in the 2013 codes, SCE's P&C has been actively engaged in the continuous refinement of EV parking space and charger requirements. This commitment extends to providing crucial technical support to significant entities such as the California Building Standards Commission (BSC), the Department of Housing and Community Development (HCD), and the California Air Resources Board (CARB).

- The 2022 CALGreen Interim Update introduces significant revisions to residential standards for multifamily, hotel, and motel properties. Notably, CALGreen eliminates distinctions based on the number of dwelling units or guest rooms on the property.
- Additionally, the Interim Update amplifies the mandate for EV Ready spaces with low-power Level 2 charging receptacles and Level 2 EVSE, eliminating EV Capable space requirements for these property types.
- For multifamily properties, the 2022 CALGreen Interim Update imposes a new EV readiness and load management mandates.

The significance of CalGREEN codes, particularly in EV parking and charger requirements, serves as pivotal guidance for local jurisdictions to adopt early or advocate for elevated standards in line with their Climate Action Plans (aka "Reach Codes").

Central HP Water Heater System Evaluations

Central Heat Pump Water Heater Systems (CHPWHS) are a technically feasible but relatively new concept for many multifamily home designers and builders. While promising improvements in hourly energy usage, flexible demand potential and GHG reduction, replacing a boiler with a CHPWHS could be a challenge to many designers and builders. In 2022, SCE P&C engaged with two project sites for conducting field evaluation, one in Delano and one in Santa Barbara. Findings from these field evaluations will help inform future opportunities for enhancements of the technology to drive code adoption.

- In late 2022, the Delano project site was completed and fully occupied in 1Q 2023. It is for low-income families and has five buildings for a total of 40 units, ranging from one- to three-bedroom units. The Santa Barbara site is a 29-unit subsidized homeless housing development that was completed in 3Q 2023 and is now fully occupied.
- At the Delano site, a hybrid heat pump water heater as a swing tank was deployed. This design concept aimed to reduce peak energy consumption from electric resistance and address the challenge of integrating HPWH equipment into the existing mechanical room. Despite the building being a new construction, the mechanical rooms were originally designed for gas boiler systems (that is, with limited space); therefore, a "packaged" HPWH system was designed to simplify installation, with prefabricated pipe assemblies and an external mounting solution for the heat pumps.
- At the Santa Barbara site, the P&C Team was involved in modifying the CHPWHS, changing one storage tank to two vertical tanks to promote thermal stratification, and locating additional temperature sensors to improve thermostatic balancing valve operation and the overall function of the system.
- Due to supply chain issues with monitoring systems, the data collection began in November of 2023 at both sites and will continue in 2024 in order to compile a

full year of data. The data illustrates that the system is performing as specified, validated with the EcoSizer, a CHPWHS designing tool funded by SCE P&C and SMUD.

Zero Flame Spread Project

California's long history of destructive wildfires, exacerbated by climate changes like rising temperatures and prolonged droughts, prompts the need for innovative solutions in home construction. This project explored the feasibility of constructing homes that not only meet California's Title 24 requirements, particularly Part 6, but also effectively curb the spread of wildfires and minimize property damage.

- SCE's P&C focused on showcasing commercially available materials to demonstrate the practicability of constructing "Zero Flame Spread" buildings, effectively blocking fire ember penetration, radiant heat, and direct flames.
- SCE conducted a controlled burn test (in conjunction with local fire department training), to showcase the benefits of a Zero Flame Spread building. This experiment demonstrated that the chosen building assembly provided additional time for residents to evacuate, enabled first responders to defend the residence, and potentially allowed the structure to endure the full duration of a fully involved neighboring building.
- Based on this project, SCE's Energy Education Center provided a class called "Zero Flame Spread Designs, Construction, and Maintenance."

Collaboration with Industry Research Groups: Standard 189.1

SCE staff continued participation as a member of ASHRAE/USGBC/IES SSPC (Standing Standard Project Committee) 189.1 "Standard for High-Performance Green Buildings, Except Low-Rise Residential Buildings" and as a member of Working Group 7.6, Energy Performance, Marginal Emissions Task Group. This Task Group was formed to update the CO_{2e} emission rates and source energy conversion factors that will be included in the 2023 version of Standard 189.1. SCE staff was able to provide funding support as well as expertise gained from being involved with the development of the CEC's hourly source energy conversion factors because these served as an excellent proxy for CO_{2e} emissions.

- SCE staff participated in various other Working Group 7.6 discussions relating to GHG emissions (such as 20-year life vs. 100-year life for methane), energy simulations for PV, alternate performance compliance approaches, and outcome-based code compliance pathways.
- P&C staff also participated with a subgroup of SSPC 189.1 to consider building resiliency requirements that may be added into the standard.
- P&C staff participated in the ASHRAE Task Force on Building Decarbonization Working Groups. The purpose of this Task Force is to set a unified direction for

how ASHRAE will approach building decarbonization across their standards, guides, guidelines, and ongoing strategies.

- P&C staff also participated in the working group that reviewed and edited drafts of the "Grid Interactive Buildings for Decarbonization: Design and Operation Resource Guide."
- P&C staff continued coordination between ASHRAE Region X and the CEC regarding the update of design temperature tables that mostly rely on 1970s weather data.
- P&C staff also coordinated the update of weather data with the ASHRAE Technical Committee 4.2, Climatic Information, that oversees weather data for the ASHRAE Fundamentals Handbook.

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8. Emerging Technologies Programs

In 2023, SCE offered two programs related to emerging electric technologies:⁷⁷

- The Local Emerging Technologies Program (ETP), and
- The Statewide Electric Emerging Technologies Program (SWEETP).

SCE's Local Emerging Technologies Program (ETP) supports the California Investor-Owned Utility (IOU) energy efficiency (EE) programs in their achievement of aggressive objectives through three subprograms:

- The Technology Assessment subprogram identifies and assesses the performance of emerging EE technologies and solutions that may be adopted by IOU EE incentive programs to be offered to customers.
- The Technology Development Support subprogram promotes efforts to increase technology supply by educating technology developers about technical and programmatic requirements for rebated (incentivized) measures.
- The Technology Introduction Support subprogram supports efforts to introduce technologies to the market by exposing end-users to applications of emerging technologies in real-world settings, as well as by using third-party projects to deploy technologies, on a limited scale, in the market.

SCE's Local ETP Program was closed to new project commitments in early 2022 when the new Statewide Electric Emerging Technologies Program (SWEETP), described below, was launched. The Local ETP Program continued efforts to complete its remaining project commitments and is on track to conclude program operations by the end of 2025.

Notable ET Program Activities in 2023

- In collaboration with ETCC leadership and partners, the Local ETP Program successfully conducted a virtual ET Summit 2023,⁷⁸ which attracted attendance and presentations from CalNEXT, the public-facing name of the Statewide Electric Emerging Technologies Program's third-party implementer, Cohen Ventures, Inc., on projects covered in the SWEETP section below. The implementer of the Statewide Market Transformation Program, California Market Transformation Administrator (CalMTA), also hosted a virtual booth to introduce stakeholders to its mission of addressing barriers to adoption of high-impact emerging technologies.
- Through the various topics covered, including Decarbonizing Water Heating, Distributed Energy Resources: Enabling Customers to Partner with the Grid,

⁷⁷ Program budgets and forecast comparisons are available at [2023 SCE Budget Filing Dashboard - CEDARS \(sound-data.com\)](#).

⁷⁸ ET Summit 2023, available at <https://www.etcc-ca.com/summits/2023>.

Low-Global Warming Potential (GWP) Refrigerants, Vision to Accelerate Decarbonization, and others, emerging technologies stakeholders from the IOUs were able to present and socialize on the progress of projects that are keystones of the topic, such as these examples:

- Evaluation of control, dispatch, and real-time signaling of behind-the-meter resources in a vulnerable community in SDG&E
- Studying use of pre-attentive color-changing schemes to enhance responsiveness to time-of-use (TOU) electric rates by SCE
- SCE's Building Electrification program, which provides low-income communities with access to clean, highly efficient space and water heat pumps, along with other related technologies, and
- PG&E's Code Readiness subprogram and Codes and Standards testing in PG&E's San Ramon Applied Technology Services, partner labs, and in the field.

Technology Assessment Subprogram

Subprogram Description

Through its Technology Assessment (TA) element, which has a historical core function of providing critical support to EE programs, the ETP evaluates performance claims of EE technologies that are new to the market or underutilized for a given application for overall effectiveness in reducing energy consumption and peak demand. A key objective of these assessments is the adoption of new measures into SCE's portfolio. Data from different sources and program tactics may be used to support assessment findings, including *in situ* testing (conducted at customer or other field sites), laboratory testing, or paper studies. In addition to other findings, assessments typically generate some of the data that EE incentive programs can use to construct a customized offering or deemed Measure Package (workpaper), estimating energy and demand savings over the life of the measure.

Project Activities in 2023

In 2023, the Technology Assessment subprogram made progress on the following projects:

- Laboratory Evaluation of Small Wall-Mounted HPWH, evaluating the lab performance of two small wall-mounted HPWHs from Europe and their ability to provide hot water in an efficient manner with lowered emissions during peak summer conditions when grid conditions are most constrained. Analyses of results showed that wall-mounted HPWHs offer efficient water heating solutions for low-demand, point-of-use needs, in small residential occupancies (using around 20-30 gallons of water).

- Examining Integrated Space Conditioning and Water Heating Technologies for a Clean Energy Future, conducting a laboratory and field study of hybrid systems that provide space conditioning and domestic hot water in the non-residential sector.
- Low-GWP Refrigerant New Construction Energy Impact Case Studies, assessing the energy and non-energy impacts of moderate-GWP (less than 1500 GWP) and low-GWP (less than 150 GWP) refrigeration design in three newly constructed supermarkets. Post-installation data will quantify energy impacts resulting from each site through a combination of controller trend logs, whole-building data, and sub-metered energy consumption data, and will then assess the impact of design strategies at each market, relative to baseline of standard practice.
- 120V Heat Pump Water Heater (HPWH) Consolidated Field Study, testing eight units in SCE service territory (among a larger statewide effort of 36 units) to enhance understanding of performance and deployment of 120V HPWHs. It is intended to be a plug-and-play solution to:
 - Meet retrofit market needs, and
 - Help address opportunities and gaps supporting program design aimed toward market adoption and transformation of all-electric hot water heating.
- Evaluation of Central Air-Source CO₂ Heat Pump Water Heating (HPWH) Systems in Multifamily Buildings, designing and piloting a central CO₂ HPWH system at a proposed 117-unit, 157,000 square-foot Culver City senior housing development. Measurement & verification (M&V) work is also included. The housing development includes independent living apartments with efficiency kitchens and a large central commercial kitchen and dining facility. Outcomes from this pilot could be used to estimate load impacts associated with electrification and to inform local developers, contractors, and program designers.

Technology Development Support (TDS)

Subprogram Description

The Technology Development Support (TDS) Subprogram assists private industry in developing or improving technologies. Although product development is the domain of private industry, IOUs are well-qualified, or in a strong position, to undertake targeted, cost-effective activities supporting product development efforts. This support decreases innovators' risks and uncertainties and allows SCE opportunities to influence the new technologies as they are developed.

Project Activities in 2023

In 2023, the TDS Subprogram made progress on the following projects:

- Demonstration of Affordable, Comfortable, and Grid Integrated Zero Net Energy (ZNE) Communities, demonstrating the technical and economic feasibility of ZNE homes by scaling a neighborhood-level experiment in Fontana to a multifamily level. Outputs from the project have provided inputs to development of Title 24, neighborhood planning tools, cost-effectiveness of ZNE homes, and utility distribution planning for ZNE home load performance.
- Zero GWP Heat Pump and Distribution System for All-Electric Heating and Cooling in California, developing, testing, and demonstrating an advanced Zero GWP space-conditioning (heating and cooling) system for multifamily or small commercial applications, based on a reversible ammonia heat pump with CO₂ distribution. The technology could be extended beyond testing to optimize system performance and could lend itself to further development.
- Demonstration of Radiative Sky Cooling System, funded by Electric Program Investment Charge (EPIC), seeking to demonstrate and validate performance of this technology in reducing electricity and water use in commercial refrigeration and HVAC systems, as well as its potential for future refrigeration or HVAC measures.

Technology Introduction Support Subprogram

Subprogram Description

The Technology Introduction Support (TIS) Subprogram supports the introduction of new technologies to the market, on a limited scale, through several activities:

- Scaled Field Placement (SFP) projects place measures at a number of customer sites as a key step toward gaining market traction and feedback. Typically, these measures have already undergone an assessment to reduce risk of failure. Monitoring activities on each scaled field placement are determined as appropriate.
- Demonstration and Showcase (D&S) projects are designed to provide key stakeholders the opportunity to "kick the tires" on proven combinations of measures that advance Zero Net Energy (ZNE) goals. D&S projects introduce measures at a systems level to stakeholders — the general public or a targeted audience — in real-world settings, thus creating broad public and technical community exposure and increased market knowledge.
- Market and behavioral studies are designed to perform targeted research on customer behavior, customer decision-making, and market behavior to gain a qualitative and quantitative understanding of customer perceptions, customer acceptance of new measures, and the market readiness and potential of new measures.

Strategies Implemented in 2023

In 2023, the TIS subprogram implemented the following strategies in support of measure development:

- Implemented SFP and D&S projects in actual field conditions, with proper COVID-19 safety precautions in place, and
- Performed primary or secondary research, as necessary, to gain market insights on technologies.

Statewide Electric Emerging Technologies Program

Program Description

The Statewide Electric Emerging Technologies Program (SWEETP), implemented by Cohen Ventures, Inc., known as CalNEXT, supports the advancement of knowledge of technology performance, market characteristics, and effective program interventions. SWEETP's vision is to identify and bring commercially available technologies promptly to the EE program portfolio by determining the latest emerging technology trends. Being at the forefront of these trends allows SWEETP to identify, prioritize, and vet these technologies, products, and solutions through a variety of tactics to:

- Assess and confirm their potential energy savings and operational performance.
- Help estimate measure cost-effectiveness.
- Identify potential barriers to market adoption, and
- Recommend promising technologies, solutions, and market interventions.

SWEETP supports the California IOU EE portfolios in identifying and evaluating promising innovations and delivery mechanisms to help drive energy and demand savings across the portfolio. This program includes the following components:

- Scanning and Screening
- Planning and Prioritization
- Focused Pilots
- Workpaper Development
- Dissemination, and
- Technology Transfer.

Strategies Implemented in 2023

Building upon the strategies SWEETP implemented in PY 2022, PY 2023 saw the initiation and/or completion of the following.

Planning and Prioritization Component

Updates to each Technology Priority Map (TPM) completed in 2022 took place across 2023. A seventh TPM that started in 2022 was completed in 2023: the Technology

Focused Pilot (TFP) TPM, guiding the selection of TFP ideas by assessing the effectiveness of interventions against barriers to adoption of either high-impact technology families, or sub-areas within a technology family covered by the six end-use TPMs.⁷⁹

Scanning & Screening (S&S) Component

The Scanning & Screening process consists of scoring each idea submission by a set of criteria, such as project outcomes and the impact of a project on DAC and HTR communities, that could support transfer of the technology to the IOU EE Portfolio or inform existing EE Portfolio programs. In 2023, the criteria showing that a technology would be beneficial and/or could potentially be transferred to the IOU EE Portfolio were weighed more heavily than they were before 2023 in scoring future projects. Similarly, the impact of ideas submitted relative to prior work, including recommendations for technology transfer already made and TPMs addressed, was also considered in reviewing and scoring idea submissions in the Scanning & Screening process.

Outreach to the public and CalNEXT partners for submissions of project ideas to be reviewed and scored continued on a quarterly basis, resulting in four completed S&S projects.

The number of project and idea submissions from the public (manufacturers and entrepreneurs) increased in 2023, as CalNEXT continued to gain momentum through attending and presenting at industry-wide outreach events and as the public developed a better understanding of the S&S process.

Technology Support Research (TSR) Component

Nineteen out of 27 TSR projects were completed in 2023, with the remaining eight to be completed in 2024-2025, depending on project scope. TSR projects are either evaluations, market studies, workpaper development, or related research to overcome adoption barriers and develop commercial capability of market-ready equipment, technology, or products identified in the TPMs. The paragraphs below describe highlights of completed projects:

- Low-income Single-family (SFR) and Multifamily (MFR) Housing Characteristics Study, which:
 - Characterized existing SFR and MFR housing for electrification readiness, using publicly available census data and field surveys of SFR sites in DAC and HTR communities, and
 - Developed interventions needed to accelerate electrification in DAC and HTR communities.
- Commercial and MF CO₂-based Heat Pump Water Heater Market Study and Field Demonstration, which measured and monitored central heat pump water heater systems, using carbon dioxide as a low-GWP refrigerant, at low-income, high-rise

⁷⁹ HVAC, Water Heating, Whole Building, Plug Load & Appliances, Process Loads, and Lighting.

multifamily buildings in San Francisco between January and October 2023 to demonstrate significant reduction in energy usage and GHG emissions, compared to energy-efficient code-compliant gas alternatives.

- Variable Refrigerant Flow (VRF) Refrigerant Management Market Assessment, which estimated that annual GHG impacts of refrigerant leaks across residential and commercial buildings were approximately two million metric tons (MMT) of CO_{2e}, with the largest contributors being residential central and commercial packaged single-zone A/C systems. Operating efficiencies of VRF technology may not be as advertised, necessitating the need to examine the next generation of VRF systems against hydrofluorocarbon (HFC) reduction targets set by the California Air Resources Board (CARB).
- Greenhouse Lighting Controls, which continued work under PG&E's Emerging Technologies Program to evaluate offering a deemed Measure Package for the technology. User experience from growers, estimated energy savings potential, records of growers' observations of crop yield and quality, outreach to stakeholders, and energy-savings models indicated that adaptive lighting controls were not suitable for a deemed measure. Implementation is highly dependent on user behavior, making it challenging to guarantee that the technology would be used correctly or consistently. This project recommended evaluating how the technology could be incentivized through Normalized Metered Energy Consumption (NMEC) projects.
- Wastewater Treatment SB 1383 Compliance Characterization, which performed market characterizations of various California Senate Bill (SB) 1383⁸⁰ Landfill Diversion compliance solutions that are under consideration or being planned by wastewater treatment facilities. The implementer classified compliance strategies by plant size, treatment type, and other key drivers and limitations, and characterized each strategy by:
 - Energy consumption
 - Demand response
 - Load management potential and fit
 - Biogas generation and cogeneration impacts
 - Carbon impacts
 - Trucking and transportation impacts
 - Creation of beneficial byproducts, and
 - Other co-benefits.
- Multifamily In-Unit Heat Pump, which examined market opportunity and technology performance of 120V and 240V variable speed, high-efficiency in-unit

⁸⁰ SB-1383, *Short-lived climate pollutants: methane emissions: dairy and livestock: organic waste: landfills*, approved Sept. 19, 2016.

heat pumps as direct replacements of less-efficient room air conditioning (A/C) or in-unit gas or electric heating units in California multifamily buildings.

Opportunities for this technology include:

- Increased demand for space cooling where there was none, and
- Retirement of aging and poor-performing in-unit gas wall furnaces.

Barriers for this technology include:

- Window type
 - Building modification
 - Permitting restrictions, and
 - Utility payment structures.
- Propane Air to Water Heat Pump Market Study, which investigated the challenges to widespread adoption of propane-based (R-290) heat pumps with low GWP, compared to heat pumps with fluorinated refrigerant gases (HFCs and hydrofluoroolefins [HFOs]). The study provided a clear set of steps for policymakers to address current regulatory and code confusion, as well as a technology roadmap for utilities, manufacturers, and other key players to bolster product availability and improve awareness and knowledge of R-290 Air-to-Water Heat Pump (AWHP) design and installation best practices.
 - Commercial Air-to-Water Heat Pump (AWHP) Market Study, which:
 - Evaluated the viability of electrifying hot water heating systems in large commercial buildings using air-to-water heat pumps
 - Sized the potential market for commercial AWHP technologies in California
 - Estimated energy and GHG savings potentials, and
 - Provided recommendations for interventions supporting AWHP adoption.
 - *Commercial Kitchen Hot Water System Design Guide*, which provided a summary of the Commercial Kitchen Hot Water System Design Guide Project and updated the *Design Guides* to demonstrate electrification and EE opportunities within commercial kitchen domestic hot water systems. Previous editions of this *Guide* did not include this additional information, which can help commercial kitchen market actors understand key considerations in designing and using kitchens to actualize decarbonization goals.

Five TSR Fast Track⁸¹ projects were completed in 2023. These projects had pre-determined outputs that addressed high-priority needs of either the IOU EE Portfolio or of measure development (that is, acquiring technical data required for a Measure Package update). The Fast Track projects included:

⁸¹ Fast Track projects can be TSR or Technology Development Research (TDR) projects.

- Updating the California Electronic Technical Reference Manual (eTRM) with new High-Integrated Part-Load Value offerings for cooling-only water-cooled chillers in Measure Package SWHC005, and developing a new Measure Package for heat-recovery chillers,
- Recommending enhancements to the eTRM Measure Packages for residential HPWH, as well as updating the CEC's Database for Energy Efficient Resources (DEER) Water Heater calculator to account for 120V HPWHs and larger tank sizing,
- Developing necessary data to create a deemed measure offering for replacement of wastewater pumps, which could be used by statewide resource programs, using the methodology of the existing approved statewide Measure Package for Waste Pump Upgrade, SWWP004-02,
- Recommending the update of existing Heat Pump (HP) Measure Packages to include requirements for crankcase heater (CCH) controls between now and 2025, since proposed 2025 Title 24 Code changes were being finalized. Crankcase heaters and other auxiliary loads could use almost half of the total energy of heat pumps. The recommendations included:
 - Making rebates available for HP projects that demonstrated compliance with CCH control requirements to ease the transition for impacted stakeholders
 - Developing new measures for heat pumps without CCHs
 - Investigating the prevalence and savings potential of unnecessary CCH operations, and
 - Evaluating how Measure Packages related to HP space-conditioning system upgrades could be expanded across baseline systems in the state's existing single-family homes and multifamily dwelling units and recommending that systems could be included in the Program Year 2026 Measure Package updates (contingent on interest of the IOUs and availability of program resources).

Technology Development Research (TDR) Component

Six out of eight TDR projects were completed in 2023, with two to be completed in 2024-2025. TDR projects are either demonstrations, evaluations, market studies, or related research focused on developing the commercial capability of early-stage equipment, technology, or products that are not yet available in the market identified in the TPMs. The paragraphs below describe highlights from the six completed projects:

- Market Potential for Heat Pump-Assisted Hot Water Systems in Food Service Facilities, which identified barriers against and opportunities for HPWH in food

service facilities, either independently or in an assist configuration.⁸²

Opportunities for HPWH would exist for food service facilities with abundant extra space, very small hot water loads, spare electrical capacity, high radiant cooking loads, and owners and operators with committed sustainability goals, as well as in new construction.

- Mobile and Manufactured Housing Market Characterization Study, which assessed the characteristics of manufactured housing, an important source of affordable housing in California, culminating in the conclusion that whole-home replacement would work better than a retrofit for energy efficiency and electrification measures. The nature of manufactured housing that limits access to low-cost financing for retrofits is one of several barriers against electrification for this type of housing stock.
- Residential Multi-Function Heat Pumps:⁸³ Heat Exchanger Improvement, which evaluated this technology that could use existing A/C electrical circuits without modification. The technology:
 - Could reduce the need for upgrades to electrical service breaker panels
 - Could reduce costs of and delays in installations, and
 - Would be less likely to trigger a need for service breaker panel or service wire upgrades in buildings without A/C, compared to the typical combination of separate space-conditioning heat pumps and stand-alone HPWHs.
- Market Characterization of Ultra-Low Global Warming Potential (GWP) Space-Conditioning Heat Pumps for Commercial Buildings, which recommended the adoption of near-future, low- and ultra-low GWP-efficient options for existing equipment, based on CARB's requirement for low-GWP refrigerants (< 750) in all new stationary A/C equipment, starting in 2025, as well as in variable refrigerant flow systems in 2026.

The following table is a snapshot of projects committed from previous years, which are forecasted for completion by the end of 2024 or 2025.

⁸² HPWH in food service facilities in an assist configuration: a smaller heat pump and storage tank upstream of an existing approved conventional water heater sized to serve food service facilities with medium to large hot water loads. The heat pump would operate during off-peak hours around 4:00-9:00 pm, and would meet the space, electrical, purchase, installation, cost, and other limitations of the existing facility.

⁸³ Multi-function heat pumps use one efficient compressor and outdoor heat exchanger coil to provide space cooling, space heating, and domestic hot water heating. Air-to-air versions of multi-function heat pumps use refrigerants to provide heating and cooling, eliminating the need for electric resistance backup heaters and reducing maximum power requirements for fullsize capacity systems to fit on existing AC electrical circuits and eliminate the need for electrical service upgrades.

Project Type	Technology Priority Maps	2024	2025
Technology Focused Pilot (TFP)	HVAC	0	1
	Process Load	2	0
	Water Heating	0	1
Technology Development Research (TDR)	HVAC	3	1
	Lighting	0	0
	Plug Loads and Appliances	1	0
	Process Loads	1	0
	Water Heating	1	0
	Whole Building	4	3
Technology Support Research (TSR)	HVAC	13	11
	Lighting	0	0
	Plug Loads and Appliances	3	2
	Process Loads	8	6
	Water Heating	4	7
	Whole Building	6	4
	Under Review	4	6

Technology Focused Pilots (TFP) Component

TFPs focus on identifying and addressing end-to-end barriers to adopting high impact technologies, and lay the foundation for future logic models for programs designed to accelerate adoption of these technologies. In PY 2023, the SCE Contract Administration team and SWEETP implementer obtained CPUC approval of AL 5017-E and 5017-E-A to implement customer recruitment and engagement for completion of the Foodservice Refrigeration: High Efficiency Condenser and Evaporator Units Focused Pilot.

The project has identified barriers against adoption of high-efficiency remote condensing and evaporator units (HEEU and HECU) used in commercial foodservice, including:

- Limited, if any, HEEU and HECU units at distributors' level at time of emergency replacement
- Initial equipment costs (particularly for small businesses), and
- Lack of contractor familiarity and education with HEEU and HECU technologies.

Interventions include two variations of the midstream incentive: one at point-of-sale in which incentives are passed through to the contractor or customer in the form of incentive or reduced invoice, and one that does not require pass-through to the contractor or customer.

A request is underway for CPUC approval of three more TFPs:

- Advanced Motors Channel Partner Support and Measure Package Development TFP, to develop measure package(s) for utility programs to offer deemed incentives for this type of technology in California, provides recommendations for developing a buyer's guide or qualifying product list (QPL) to raise industry awareness and understanding of the technology,
- HPWH Conversion Readiness TFP, using targeted outreach paired with heat pump readiness assessment and a list of available customer incentives to address customers' concerns with bill impacts, offers free home remediation, electrical upgrades, and gas loaner service to address electrical upgrades associated with heat pump projects.
- Supply Chain Engagement for Increasing Packaged Unitary Heat Pump System Adoption TFP, a midstream pilot to interview supply-chain players to identify barriers and design requirements for off-the-shelf commercial heat pump rooftop units (HP RTUs) and custom HP RTU systems larger than 20 tons.

Outreach Events

Throughout PY 2023, CalNEXT has continued participation and dissemination of in-progress or completed projects in industry conferences, including the 14th International Energy Agency (IEA) Heat Pump Conference, California Efficiency and Demand Management Council (CEDMC) Fall Conference, and others, which have resulted in increased public understanding of CalNEXT and its Scanning & Screening process for screening ideas submitted by the public for emerging technologies.

Most notable of the CalNEXT outreach efforts is participation in the 2023 ET Summit during which CalNEXT shared findings from market studies to understand and address barriers against electrification in areas where fuel substitution would be most challenging, such as HTR and DAC communities and industrial application of heat pumps. Sample projects shared in the 2023 ET Summit include:

- The Mobile and Manufactured Housing (MMH) Market Characterization Study, which assessed building codes impacting affordable housing stock, such as mobile and manufactured homes, for which there is little uniformity and updates are infrequent. The project also developed baselines for new and existing MMH by climate zone and identified energy, peak load, carbon, and cost reduction potential for retrofit and whole home replacements.
- The All-Electric Commercial Kitchen Electrical Requirements Project, which determined electric load requirements, electrical service upgrade costs, potential load growth, and available kitchen types for all-electric commercial kitchens (quick-service restaurants, full-service restaurants, and institutional kitchens).

9. Workforce Education & Training (WE&T) Program

The Statewide Workforce Education and Training (WE&T) Program is a comprehensive program focused on education, training, and workforce development, funded by and/or coordinated with the Investor-Owned Utilities (IOUs). The WE&T Program consists of one SCE-administered local subprogram, WE&T Integrated Energy Education and Training (IEET), and two statewide subprograms administered by Pacific Gas & Electric Company (PG&E):

- Statewide WE&T Career Workforce Readiness (CWR), and
- Statewide WE&T Connections.⁸⁴

In 2023, the WE&T IEET Program collaborated with various stakeholders, professional and trade organizations, government agencies, and other education and training providers, to enhance its offerings. The Program focused on three primary areas:

- Expanding the Program's reach to a wider audience
- Evolving the Program to address customer, market, and industry needs, and
- Collaborating with industry and stakeholders to build upon each other's strengths.

Integrated Energy Education and Training (IEET) Subprogram

Subprogram Description

The locally-administered IEET Subprogram is designed to promote demand-side management (DSM) through the enhancement of workforce knowledge and technical training in various sectors. The Subprogram's main in-person delivery venues include SCE's two Energy Education Centers ("Centers") in Irwindale and Tulare, California, and the Foodservice Technology Center (FTC) in Irwindale. These facilities provide a wide range of educational offerings, including workshops, seminars, tool and induction loans, equipment demonstrations, consultations, and community outreach events. Participants can access free or low-cost educational resources such as online content and additional information that is made available through satellite and partnership collaboration locations.

The program provides technical upskill training to market actors, the workforce, and people in Disadvantaged Worker (DW) 85 communities, enabling them to thrive in the energy efficiency (EE) industry while supporting the achievement of California's greenhouse gas (GHG) reduction goals and SCE's Pathway 2045.

⁸⁴ Program budgets and forecast comparisons are available at [2023 SCE Budget Filing Dashboard - CEDARS \(sound-data.com\)](#).

⁸⁵ The term "Disadvantaged Worker" is defined in D.18-10-008, §4.5.1, at p. 52.

2023 Program Activities

Noteworthy 2023 IEET Subprogram highlights include:

- The Centers successfully launched and delivered a comprehensive educational program focused on Building Electrification and Fuel Substitution topics, while sustaining existing HVAC and other training topics. These programs, designed for both the general public and market actors, equip participants with the knowledge and skills necessary to navigate the transition toward sustainable and decarbonized building operation.
- Collaborations with community-based organizations (CBOs) and educational institutions expanded the reach of IEET offerings, which enabled the Centers to extend their educational resources and program to diverse communities. For instance, the collaboration with Strategic Energy Innovations (SEI) on the Energize Colleges program provided education and training to college students, preparing them for EE careers while promoting energy conservation on campuses.
- The Mobile Education Unit (MEU), launched at the end of the 2022 calendar year, focused on expanding its reach in 2023 to disadvantaged and underserved communities while maintaining its commitment to educating market actors and trade professionals. This initiative aimed to reduce barriers for underserved communities by bringing hands-on demonstrations and educational opportunities directly to areas that may have faced challenges in accessing traditional educational channels.
- Lending programs, including the Tool Lending Library (TLL) and Induction Lending Program (ILP), which provide energy measurement and building performance evaluation tools, as well as induction cooking equipment, have expanded their product offerings and increased customer participation through extensive marketing efforts.
- The Foodservice Technology Center (FTC) continued to expand its reach through strategic collaborations while continuing to offer customer events, including trainings for small businesses and technical consultations. By fostering collaborations and providing tailored support, the FTC has empowered businesses to adopt sustainable practices and make significant changes in equipment selection in the food service industry.

Energy Education Centers

In 2023, the Centers focused on optimizing operations and streamlining processes to deliver high-quality, engaging, and impactful training in a hybrid environment. This emphasis on operational efficiency allowed the Centers to maximize resources and provide a seamless learning experience for participants. By offering both in-person, online courses, and

on-demand courses, the Centers empowered the workforce and market actors with the knowledge and skills needed to support California's clean energy future.

The Centers enhanced their online offerings by increasing instructor-led programming and launching an on-demand platform. This comprehensive suite of online learning opportunities provided participants with the flexibility to access energy education at their convenience. The addition of the on-demand platform significantly increased the accessibility of energy education, enabling the Centers to reach a wider audience and support continuous learning and technical upskilling. By leveraging technology to deliver high-quality educational content, the Centers demonstrated their commitment to adapting to the evolving needs of the energy industry.

The following metrics highlight the impact of the Centers' efforts in engaging participants and driving attendance to IEET offerings, surpassing previous years' achievements:

Table 9-1. 2023 Energy Education Centers Performance

Goal	Target	Actual
Collaborations	4	12
Number of Participants	17,401	23,844 *
Number of Participants – Residential	6,560	19,221
Number of Participants – Commercial	10,841	4,623
Percentage of Target Audience Reached **	2.0%	2.2%
Percentage of Disadvantaged Worker Participants (CalEnviroScreen 4.0)	43%	77.2%

* Totals are inclusive of the 2023 Foodservice Technology Center Customer Activities.

** Based on Rulemaking 13-11-005: Amended 2020 Annual Report For Energy Efficiency Programs.

Curriculum Focus Areas

Fuel Substitution and Building Electrification

In 2023 the Energy Education Centers launched a Fuel Substitution curriculum, which included a series of Building Electrification Fundamentals Courses. These courses provided a strong foundation for participants before branching off into two educational pathways, with a Residential and Nonresidential focus. This strategic approach enabled customers to choose from classes focused on their current needs that addressed the unique challenges and requirements of electrifying residential and nonresidential buildings. By providing specialized courses, participants gained in-depth knowledge and practical skills relevant to their sectors, enabling them to effectively navigate the electrification process and adapt to the specific needs of different building types. Including the fundamental classes, 54

unique classes were developed and delivered. The following paragraphs highlight the range of the curriculum:

- Building Electrification Fundamentals: "BE & Me," "An Overview of BE," "Introduction to BE Technologies," and "The Financial Costs and Benefits of the BE Transition."
- Agricultural Electrification: Electrification solutions for the agricultural sector, guides to field equipment, electrification of food processing, smoking, drying, and canning, and solutions for dairies, creameries, and breweries.
- Heat Pump Water Heating (HPWH): Benefits of HPWHs and Commercial HPWHs for hospitals, clinics, schools, and multifamily settings, providing deep dives into commercial HPWH engineering.
- Residential Electrification for Homeowners: Why and how to electrify, explaining home energy to homeowners, how to plan a home electrification project, and case studies.
- Residential Electrification for Contractors: Preparing for residential electrification by understanding the roles that insulation, air-sealing, and ventilation play, and residential HPWHs challenges with sales and installation.

Heating, Ventilation and Air Conditioning (HVAC)

In 2023, the Centers sustained their comprehensive HVAC education and training programs as part of the IEET Program. These courses provided specialized education and training opportunities across all levels of the HVAC value chain. Through strategic collaborations with industry stakeholders, the Centers identified skill gaps and opportunities for workforce education, supporting the transition to a clean energy economy.

- The National Comfort Institute (NCI), a third-party provider, focused on delivering intermediate and advanced-level HVAC performance-based, hands-on certification trainings aimed to equip HVAC professionals with the skills and knowledge necessary to ensure high-quality installations, maintenance, and services that promote energy efficiency and sustainability. These comprehensive courses covered a wide range of topics, including:
 - Air balancing
 - System performance optimization
 - Economizer and ventilation optimization
 - Duct system optimization
 - Combustion performance, and
 - Performance-based selling of energy-efficient systems.

Table 9-2. 2023 NCI Performance

Metric	Actual
Total Training Hours	Over 400
Participants Certified	Approx. 250
Continuing Education Units (CEUs) Awarded	Approx. 1,100
Percentage of Intermediate or Advanced Level Classes	92%
Percentage of Disadvantaged Workers Trained	53%

- The Institute of Heating and Air Conditioning Industries (IHACI), a third-party provider, supported the delivery of HVAC Residential and Commercial Quality Installation (QI), Quality Maintenance (QM), and Quality Service (QS) training. These programs aimed to teach contractors the best practices for installing and servicing HVAC&R systems that meet all installation requirements, ensuring optimal efficiency and capacity.

Table 9-3. 2023 IHACI Performance

Metric	Actual
Evening Classes Delivered	Over 70
NATE Certification Exams Held	2
Contractors and Technicians Trained	Over 2,400

- The third-party provider, HVACRedu.net, an online and on-demand training organization, delivered the "It's About Q" program throughout SCE's service territory. This program focused on standards-based skills training for quality installation and maintenance of commercial and residential HVAC systems. In 2023, additional courses were added to support California's and SCE's decarbonization goals, including "Commercial HVAC Bootcamp," "Direct Digital Controls Bootcamp," and "Commercial Water Source Heat Pump System" classes.

Table 9-4. 2023 HVACRedu.net Performance

Metric	Actual
NATE Core, Ready to Work, and Specialty Exams Delivered	Over 250
Online Class Modules Completed	Over 14,500

- Several Low Global Warming Potential (GWP) Refrigerants classes were offered to help HVAC Contractors lower greenhouse gas emissions and meet regulatory requirements. These classes equipped participants with the knowledge to navigate

regulatory changes, consider environmental impacts, and adopt practices that reduce the carbon footprint of their operations.

- The Centers, in partnership with the North American Sustainable Refrigeration Council (NASRC), hosted the groundbreaking "Natural Refrigerant Training Summit." This two-and-a-half-day event brought together over 350 refrigeration professionals from across North America for 60 training sessions on CO₂ and propane refrigeration systems. The summit featured hands-on training with mobile CO₂ units and valuable networking opportunities for students, contractors, and technicians, setting the stage for an annual industry event.

Integrated Demand Side Management (IDSM) Activities

The Centers remained committed to promoting Integrated Demand Side Management (IDSM) principles through their educational seminars and workshops. These training programs seamlessly integrated energy efficiency (EE) and demand response (DR) concepts, providing participants with a holistic understanding of energy management practices.

The curriculum covered, but was not limited to:

- HVAC&R Systems
- Variable Refrigerant Flow
- Programmable Logic Controllers
- Heat Pump Retrofits
- Title 24 Lighting Code Updates
- All-Electric Residential Buildings
- Advanced Framing Techniques
- Building Envelopes
- Demand Response Programs, and
- Grid-Interactive Controls.

This holistic approach empowered attendees to leverage the combined benefits of EE and DR strategies while implementing integrated demand-side management practices.

External Collaborations

The Centers collaborated with 12 community-based organizations (CBOs), educational institutions, other industry stakeholders, and training organizations to expand the access and reach of IEET offerings in 2023. These collaborations aimed to broaden the reach of energy education and workforce development programs, ensuring that a diverse range of communities and professionals' benefit from the Centers' resources and expertise.

- **Architecture at Zero Design Competition:** The Architecture at Zero 2023 design competition, sponsored by SCE and other Statewide WE&T IOUs, challenged participants to design a sustainable agriculture center in Allensworth, California, the state's first Black town. The competition engaged architecture, design,

engineering, planning professionals, and students in decarbonized design, promoting innovative solutions for Zero Net Energy (ZNE) buildings. By highlighting the need for equity and resilience in the built environment, the competition aimed to broaden thinking about the technical and aesthetic possibilities of decarbonized projects. This resulted in four collaborations with educational institutions:

- Bakersfield College
 - Fresno State University
 - Rancho Cucamonga High School, and
 - University of Southern California (USC).
- Energize Colleges Program of SEI: In 2023, the Energize Colleges Program, a collaboration with Strategic Energy Innovations (SEI), established five collaboration agreements with community colleges and universities in SCE's service territory, including:
 - Citrus Community College
 - San Bernardino Community College District (SBCCD)
 - Riverside Community College District (RCCD)
 - Los Angeles Community College District (LACCD), and
 - Riverside Community College District (RCCD).

The program also achieved significant milestones in energy education and workforce development, supporting four Climate Corps Fellowships, completing seven academic projects integrating energy concepts into curricula, and conducting five group training events reaching over 90 individuals. These efforts aimed to increase awareness among the next generation of energy professionals and promote clean energy adoption.

- Proteus, Inc.: The Centers continued their collaboration with Proteus, Inc., to develop and deliver energy efficiency training to students from Proteus' workforce. Proteus agreed to assist with course framework development, promote sessions, recruit students, and provide the necessary space and technology for online participation. The knowledge shared through this collaboration will empower Proteus' workforce to reach underserved communities, expanding access to energy education and future career opportunities.
- California Restaurant Foundation (CRF): SCE's WE&T Foodservice Technology Center collaborated with the California Restaurant Foundation (CRF) on the Culinary High School Education/Training project, targeting high school students in SCE's service territory interested in food service and hospitality careers. In 2023, the project refined the Culinary Capstone Curriculum, expanded to include two high schools in California's Central Valley and young adult programs hosted by CBOs, developed instructional videos, and provided hands-on training with commercial kitchen equipment. The collaboration aimed to equip students with

the knowledge and skills needed to succeed in the food service industry while promoting sustainability and efficiency.

- Induction Lending Program (ILP): SCE's collaboration between SCE WE&T and equipment manufacturers Vollrath, Garland, Hatco, Equipex, and Nemco is unique in its ability to lend commercial-grade induction equipment to both residential and commercial customers, including restaurants, setting it apart from other IOU lending programs that focus solely on residential lending. By providing no-cost loans of high-quality induction units and cookware, the program encourages the adoption of efficient electric cooking in the commercial restaurant industry, supporting SCE's building electrification and Clean Energy Pathway goals. This collaboration promotes energy efficiency, advances workforce education, and significantly contributes to California's decarbonization efforts in the commercial food service sector.

Internal Collaborations

Codes & Standards

Collaboration between the WE&T Program and SCE's Codes and Standards Program is crucial in ensuring that the workforce is well-equipped to effectively achieve SCE's clean energy and decarbonization goals. By prioritizing the education of market actors on emerging codes and standards, this partnership enables professionals to stay informed and adapt to the evolving landscape of EE regulations.

In 2023, the collaboration resulted in the delivery of 49 online and in-person seminars to 745 customers throughout SCE's service territory. These seminars covered a wide range of topics including Title 24 energy codes, CALGreen codes, energy modeling software, and ventilation in energy-efficient homes. The targeted industry sectors for these offerings included plans examiners, building inspectors, energy code compliance building modelers, architects, engineers, building envelope and lighting designers, HVAC technicians, and other trade professionals.

By providing comprehensive training on these subjects and focusing on key stakeholders, the collaboration ensures that energy efficiency is prioritized throughout the building lifecycle, from design and construction to ongoing operation and maintenance. When buildings are designed with a holistic approach that incorporates the latest codes and standards, they are inherently more energy-efficient and sustainable, which mitigates the need for costly retrofits and upgrades in the future.

Mobile Education Unit (MEU)

The Mobile Education Unit (MEU), a component of the IEET program, played a crucial role in advancing clean energy adoption across SCE's service territory. In its full year of deployment in 2023, the MEU focused on outreach to underserved and hard-to-reach rural communities, aiming to educate market actors about the benefits of a cleaner California.

The MEU's impact extended beyond simply providing education on electrification technologies. It served as a valuable resource, promoting the Energy Education Centers' classes and the Tool Lending Library, and ensuring widespread awareness and accessibility to these valuable resources. Through its participation in 81 diverse events, including career fairs, college fairs, home shows, energy conferences, county fairs, and more, the MEU achieved over 44,000 customer engagements, directly connecting with communities that may face barriers to accessing traditional educational channels.

Lending Programs

The Energy Centers' lending programs, including the Tool Lending Library (TLL) and Induction Lending Program (ILP), played a vital role in promoting energy efficiency and sustainable practices. These programs aimed to enable accessibility to essential resources and empower individuals, professionals, and organizations to make informed decisions regarding energy consumption and building performance. By providing access to specialized tools and equipment, the lending programs facilitated hands-on experience, project implementation, and the exploration of emerging technologies.

- The Tool Lending Library (TLL) provided over 400 energy measurement and building performance evaluation tool loans to homeowners, business owners, contractors, and professionals, including some beyond SCE's service area, with over 275 new program registrants. This represents a 120% increase in tool loans from 2022, supporting disadvantaged workers by offering access to tools they might not otherwise have access to.
- The Induction Lending Program (ILP), which provides induction cooktops and equipment, achieved a remarkable 250% increase in loan transactions compared to 2022, completing 65 loans to residential customers, commercial customers, community-based organizations, and SCE employees. Organizational efforts focused on creating operational hubs, both internally at the SCE Service Center in Irvine and externally through community partnerships with the High Sierra Energy Foundation located in the Mammoth Mountain region and the Southern California AltaMed Health Services Corporation. These hubs aimed to provide easier pickup locations and improve accessibility for customers, particularly in hard-to-reach and disadvantaged communities.

Foodservice Technology Center Activities

The Foodservice Technology Center (FTC) played a pivotal role in promoting electrification and empowering professionals across the commercial food service industry. Through a wide range of activities, including consultations, training programs, collaborations, and demonstrations, the FTC made significant strides in advancing sustainable practices and fostering culinary innovation.

- **Culinary Student Training:** The FTC provided training to culinary students and their teachers in high school, community college, and university programs, both in

person and virtually. By partnering with educational institutions, the FTC helped shape the next generation of culinary professionals, equipping them with the knowledge and skills needed to embrace electrification and sustainable practices in their future careers.

- **Consultations and Electrification Projects:** Consultations conducted by the FTC doubled compared to 2022, with the center providing guidance on significant electrification projects. These projects included the remodeling and transformation of California State Dominguez Hills' Dining Hall, the replacement of All Saints Episcopal Church Riverside's kitchen appliances from gas to electric, and the redesign of the Long Beach Boys and Girls' Club kitchen to an all-electric, induction-powered commercial configuration. These consultations showcased the FTC's expertise in facilitating the transition to electric cooking technologies and demonstrated the tangible impact of their efforts in promoting electrification.
- **Codes and Standards Advancements:** In collaboration with SCE's Codes & Standards Program, the FTC made significant advances by providing 95% of the data for a new EnergyStar Electric Cooktop Specification project which launched in 2023. This contribution underscores the FTC's role in shaping industry standards and promoting the adoption of energy-efficient electric cooking appliances.
- **Operational Activities:** The FTC conducted many events throughout the year, ranging from equipment demonstrations to webinars, seminars, trainings, consultations, tours, field assessments, trade shows, and community events. These diverse activities allowed the FTC to engage with SCE customers and industry professionals, providing valuable education and support in the adoption of energy-efficient and electric cooking technologies.

Table 9-5. 2023 Foodservice Technology Center Customer Activities

Activity Types	Number of Events	Number of Attendees
Equipment Demonstrations	55	958
Webinars/Seminars/Trainings	37 *	788 *
Consultations	11	52
Tours	33	340
Field Assessments	10	18
Tradeshows/Events	14	1660
Total	160	3,816

* Totals are a subset of those given in Table 9-1, 2023 Energy Education Centers Performance, above.

Appendix A. Annual Report Tables

Section 1: Energy Savings

Table 1a. 2023 Net First Year Savings, Goal Attainment and Fuel Sub Load Reduction Adjustments ⁸⁶

T-1 2023 Net First Year Savings, Goal Attainment and Fuel Sub Load Reduction Adjustments						
	GWh	MW	MMTherms	GWh	MW	MMTherms
	Portfolio - Non C&S			Codes & Standards		
2023 Total Installed Portfolio Savings	217	19	-	1,223	235	-
Adopted Goals (D.21-09-037)	461	69	-	1,016	200	-
Percentage of goal attainment	47%	28%	N/A	120%	117%	N/A
Fuel Substitution Goal Reduction see Tab 2, Table 2B	-		-			
Goals less FS Goal Reduction (7-9 not reflected in CEDARS unless requested)	461	69	-			

1 This Table includes REN/CCA Achievements for IOUs
2 D.22-05-016 corrected the Adopted Goals from D.21-09-037

In 2023, the following five programs (Table 1b., below) and program strategies accounted for approximately 94% percent of SCE's total portfolio net electric demand reduction results (excluding the Codes & Standards and ESA programs).⁸⁷

**Table 1b. Top Five Programs by Percentage of Savings
(Excluding Codes & Standards and Energy Assistance)**

Top 5 Programs by Percentage of Savings (Excluding Codes and Standards and Energy Assistance Program)			
Program ID	Program Name	% of GWh	First Year Net GWh
SCE-13-SW-001A	Energy Advisor Program	45%	93
SCE_3P_2020RCI_005	Comprehensive Commercial Program	32%	67
SCE-13-SW-003D	Strategic Energy Management Program	11%	23
SCE_SW_HVAC_Up	Upstream HVAC Comm + Res	4%	9
SCE-13-SW-002B	Commercial Calculated Program	2%	3

⁸⁶ The data shown in this Annual Report is based on SCE's ex ante savings, adjusted for actual installations, consistent with the ex ante values and processes adopted by the CPUC in D.11-07-030, *Third Decision Addressing Petition for Modification of Decision 09-09-047*. Values in table include market effects (ME) of 5% as consistent with CEDARS.

⁸⁷ This percentage was calculated using 1st year net kWh for the 5 listed programs divided by total portfolio (excluding C&S and ESA).

Section 2: Fuel Substitution

Table 2a. New Fuel Program Administrator Savings

T-2 Fuel Substitution Savings
For more information on Fuel Substitution (FS), please visit: <https://www.cpuc.ca.gov/about-cpuc/divisions/energy-division/building-decarbonization/fuel-substitution-in-energy-efficiency>

2-1 New Fuel Program Administrator Savings [1]

Fuel Substitution Measure Use Category [8]	Energy Savings (MMBTU) [2]	New Fuel Units [3]	New Fuel Savings Conversion [4]		Original Fuel Goals Reduction (PY activities)			Building infrastructure upgrades necessitated by installation of FS measures [7][9]		
			GWh	MMThm	Utility [5]	GWh [6]	MMThm [6]	Electric (\$)	Gas (\$)	Other (\$)
Appliance or Plug Load	14	kWh	0	-	SoCalGas	-	0	\$ -	\$ -	\$ -
Building Envelope	-		-	-		-	-	\$ -	\$ -	\$ -
Compressed Air	-		-	-		-	-	\$ -	\$ -	\$ -
Commercial Refrigeration	-		-	-		-	-	\$ -	\$ -	\$ -
Codes & Standards	-		-	-		-	-	\$ -	\$ -	\$ -
Food Service	-		-	-		-	-	\$ -	\$ -	\$ -
HVAC	25,413	kWh	7	-	SoCalGas	-	0	\$ -	\$ -	\$ -
Irrigation	-		-	-		-	-	\$ -	\$ -	\$ -
Lighting	-		-	-		-	-	\$ -	\$ -	\$ -
Non-Savings Measure	-		-	-		-	-	\$ -	\$ -	\$ -
Process Distribution	-		-	-		-	-	\$ -	\$ -	\$ -
Process Drying	-		-	-		-	-	\$ -	\$ -	\$ -
Process Heat	-		-	-		-	-	\$ -	\$ -	\$ -
Process Refrigeration	-		-	-		-	-	\$ -	\$ -	\$ -
Recreation	-		-	-		-	-	\$ -	\$ -	\$ -
Service	-		-	-		-	-	\$ -	\$ -	\$ -
Service and Domestic Hot Water	188,077	kWh	55	-	SoCalGas	-	2	\$ 1,565,865	\$ -	\$ -
Whole Building	-	kWh	-	-	SoCalGas	-	-	\$ 24,786	\$ -	\$ -
TOTAL	213,504		63	-		-	2	\$ 1,590,651	\$ -	\$ -

- Separate accounting of Fuel Substitution claims sponsored by the new-fuel PA submitting these tables.
- Claimable net energy savings in MMBTU. This is a calculated energy conversion from columns D:E.
- Unit of savings for the new fuel (either kWh or Thm)
- Claimable savings for the new fuel (this is not actual grid savings, but the net savings converted to unit of the new fuel). CEDARS CET output fields "First Year Net kWh" and "First Year Net Therm" apply to this conversion and should be used in these cells.
- The original fuel utility whose goals should be adjusted.
- This is the amount that the original fuel utility's goals should be reduced. These are calculated as an energy conversion from the net new fuel savings in columns D:E. Reductions for the original fuel utility goals are to be summarized in Table 2B of the original fuel utility's Annual Reports.
- Required for Downstream measures only. See D.19-08-009 OP 4 for more information.
- Measure Use Categories listed here are the descriptions that correspond directly to the CET field "CET_ID__UseCategory" (or "UseCategory") codes.
- Costs are for SCE Operated programs and do not include costs from SW programs lead by other IOUs

Table 2b. Original Fuel Utility Goals Reduction

2-2 Original Fuel Utility Goals Reduction [9]

Program Administrator Sponsoring New Fuel Measure [10]	Original Fuel Goals Reduction (PY activities) [11]		Original Fuel Goals Reduction True-up (PY-1 activities) [12]		Total PY Goals Reductions	
	GWh	MMThm	GWh	MMThm	GWh	MMThm
PG&E	-	-	-	-	-	-
SCE	-	-	-	-	-	-
SDG&E	-	-	-	-	-	-
SoCalGas	-	-	-	-	-	-
3C-REN	-	-	-	-	-	-
BayREN	-	-	-	-	-	-
I-REN	-	-	-	-	-	-
MCE	-	-	-	-	-	-
RuralREN	-	-	-	-	-	-
SoCalREN	-	-	-	-	-	-
RCEA	-	-	-	-	-	-
SJCE	-	-	-	-	-	-
Total Goal Reduction	-	-	-	-	-	-

- Goals reductions for the original fuel utility from all applicable PAs. This table is only populated by utilities whose fuels were the original fuel for a Fuel Substitution Measure to reflect their reduction in goals. Non-IOU PAs or utilities who were not the original fuel leave this table
- Name of PA which sponsored fuel substitution measures that affect the reporting utility (as documented in the sponsoring PA's Annual Report).
- When feasible, these values should equal the goals reductions listed in corresponding sponsoring PA's Table 2A for the original fuel utility.
- True-up values only used if/when the original fuel utilities goals reductions for PY-1 did not equal the sponsoring PA goals reductions for PY-1; see D.19-08-009 OP 7.

Section 3: Emission Reductions (Environmental Impacts)

Table 3. Environmental Impacts (Net) ⁸⁸

T-3 Environmental Impacts of EE Portfolio by Measure Use Category

Measure Use Category	Gross annual tonnes of CO ₂ avoided ¹	Net annual tonnes of CO ₂ avoided ¹	Gross lifecycle tonnes of CO ₂ avoided ¹	Net lifecycle tonnes of CO ₂ avoided ¹	Gross annual tonnes of NOx avoided ²	Net annual tonnes of NOx avoided ²	Gross lifecycle tonnes of NOx avoided ²	Net lifecycle tonnes of NOx avoided ²	Gross annual tonnes PM10 avoided ²	Net annual tonnes PM10 avoided ²	Gross lifecycle tonnes PM10 avoided ²	Net lifecycle tonnes PM10 avoided ²
Appliance or Plug Load	65,695	24,702	601,596	198,896	17	6	139	46	6	2	46	15
Building Envelope	27,058	16,388	576,417	344,599	7	4	122	73	2	1	40	24
Compressed Air	1,636	551	29,827	10,037	0	0	6	2	0	0	2	1
Commercial Refrigeration	74,586	25,984	638,719	236,663	20	7	152	57	6	2	49	18
Codes & Standards	156,888	26,994	3,268,527	520,567	41	7	691	111	14	2	229	37
Food Service	8,815	2,613	218,958	61,092	2	1	45	13	1	0	15	4
HVAC	100,276	37,285	1,862,796	638,818	26	10	401	140	8	3	131	45
Irrigation	259	91	1,446	508	0	0	0	0	0	0	0	0
Lighting	655,417	173,469	8,580,341	2,577,730	172	45	1,918	567	57	15	635	188
Non-Savings Measure	-	-	-	-	-	-	-	-	-	-	-	-
Process Distribution	692	452	6,148	3,945	0	0	1	1	0	0	1	0
Process Drying	-	-	-	-	-	-	-	-	-	-	-	-
Process Heat	52	37	898	645	0	0	0	0	0	0	0	0
Process Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-
Recreation	6,895	3,387	86,127	43,009	2	1	19	10	1	0	6	3
Service	25,837	27,129	25,837	27,129	7	7	7	7	3	3	3	3
Service and Domestic Hot Water	13,782	11,218	140,190	108,932	10	10	101	97	0	0	0	3
Whole Building	44,738	27,828	926,816	518,013	12	8	195	110	4	3	65	37
TOTAL	1,182,625	378,129	16,964,642	5,290,584	317	106	3,799	1,235	102	32	1,221	372

SOURCE: CET Outputs

[1] For 2023 PY, CO₂ emissions in CEDARS are expressed in metric tons for electric and short tons for gas. Conversions are done in this table to represent metric tons (denoted as Tonnes) for the total.

[2] For 2023 PY, NOx and PM10 emissions in CEDARS are represented as pounds; Conversions are done in this table to represent in metric tons (denoted as Tonnes) for the totals.

⁸⁸ The data shown in this Annual Report is based on SCE's ex ante savings, adjusted for actual installations, consistent with the ex ante values and processes adopted by the CPUC in D.11-07-030.

The Commission has mandated that the utilities report their results using the Cost-Effectiveness Tool (CET). This tool includes many embedded calculations, such as avoided costs and emission factors, that have been approved by the Commission. Pursuant to the Commission's authorization, SCE entered its results into the CET and determined the amount of emission reductions attributed to the successful implementation of the 2023 portfolio of EE programs. These results are shown in *Table 3*, above.

The environmental benefits utilized in the cost-effectiveness analysis of the programs included in this document are only applicable to EE program reporting. The factors utilized in the development of these environmental benefits were agreed upon specifically to reflect an appropriate and approximate value for the reduced energy savings due to EE programs. As such, these environmental benefits should not be used in any other context and should also be reviewed for future use in EE program planning and evaluation.

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Section 4: Expenditures and Cost Effectiveness

Table 4. 2023 Expenditures, Including Expenditures from Past Cycle Commitments, Paid in 2023 ⁸⁹

Table 4 is available on the California Energy Data and Reporting System (CEDARS) home page at <https://cedars.sound-data.com/documents/standalone/list/>.

1. On the Homepage section of CEDARS, click the *Documents* link on the upper mid-section of the page.
2. The *Documents* link takes you to a list of key EE documents, including the IOUs' EE annual reports.
3. The *Table 4* file is titled *SCE_2023_Annual_Report_Appendices* and can be found on Tab T-4 Program Data.

Following is a description of what each metric means in terms of the overall portfolio's progress in producing net resource benefits for customers.

- The Total Resource Cost Test (TRC) measures the net benefits of a program as a resource versus the participants' costs and program administration costs.
- The Total Resource Net Benefit (Net RBn) amount is the result of subtracting Total TRC costs from Total Resource Benefits.
- The Ratepayer Impact Measure (RIM) test measures to the effect on customer bills or rates due to changes in utility revenues and operating costs caused by the program. This test indicates the direction and magnitude of the expected change in customer bills or rate levels. SCE has a RIM test of 8.80 including Codes and Standards and 0.627 without Codes and Standards. A benefit-cost ratio above one (1.0) indicates that the program will lower rates and bills.

Total TRC Costs shown in the table include the sum of the total administrative costs and the incremental measure or participant cost. The TRC costs also represent the changes to the TRC test made in D. 07-09-043.⁹⁰

The Program Administrator Cost (PAC) Test measures the net benefits of a program as a resource versus the total program costs, including both the program incentive and program administration costs.

⁸⁹ The data shown in this Annual Report is based on SCE's ex ante savings, adjusted for actual installations, consistent with the ex ante values and processes adopted by the Commission.

⁹⁰ D.07-09-043, *Interim Opinion on Phase 1 Issues: Shareholder Risk/Reward Incentive Mechanism for Energy Efficiency Programs*.

Section 5: Segment Summary

Table 5. Program Administrator (PA) Savings by Sector and Segment

T-5 PA Savings By Sector and Segment ¹										PY2023 ENERGY SAVINGS (Net)				
Sector	2023 Approved Budget	2023 Expenditures	Expenditure % of Budget	TRC Ratio	PAC Ratio	RIM Ratio	Total System Benefit	TRC Net Benefits	PAC Net Benefits	First Year Net GWh	Lifecycle Net GWh	First Year Net MW	First Year Net MMTherms	Lifecycle Net MMTherms
Resource Acquisition														
Agricultural	\$ 6,754,495	\$ 859,903	13%	0.83	0.99	0.99	\$ 814,393	\$ (170,659)	\$ (10,393)	0.81	7.77	0.19	-	-
Commercial	\$ 144,619,581	\$ 64,349,631	44%	0.57	0.69	0.69	\$ 37,364,376	\$ (45,932,958)	\$ (26,653,935)	82.31	798.99	2.20	0.16	0.83
Industrial	\$ 53,006,397	\$ 5,715,361	11%	1.50	1.97	1.97	\$ 11,241,455	\$ 3,754,657	\$ 5,563,549	24.80	125.31	2.93	0.00	0.02
Public	\$ 12,306,645	\$ 2,311,134	19%	0.07	0.38	0.38	\$ 742,971	\$ (10,276,190)	\$ (1,212,103)	1.19	8.15	0.56	0.00	0.01
Residential	\$ 74,587,725	\$ 20,565,794	28%	0.83	0.86	0.87	\$ 17,238,229	\$ (3,631,806)	\$ (3,018,983)	99.33	148.51	13.29	0.06	0.89
Cross-Cutting	\$ 535,091	\$ 1,169,327	219%	0.16	0.28	0.28	\$ 310,995	\$ (1,592,695)	\$ (801,978)	0.43	3.21	0.05	-	-
Resource Acquisition Subtotal	\$ 291,809,933	\$ 94,971,150	33%	0.61	0.78	0.77	\$ 67,712,420	\$ (57,849,651)	\$ (26,133,842)	208.87	1,091.95	19.22	0.22	1.72
Market Support														
Agricultural	\$ 336,802	\$ 309,030	92%	-	-	-	\$ -	\$ (309,030)	\$ (309,030)	-	-	-	-	-
Commercial	\$ 1,985,976	\$ 959,869	48%	-	-	-	\$ -	\$ (959,869)	\$ (959,869)	-	-	-	-	-
Industrial	\$ 1,168,033	\$ 104,522	9%	-	-	-	\$ -	\$ (104,522)	\$ (104,522)	-	-	-	-	-
Public	\$ 435,334	\$ 612,802	141%	-	-	-	\$ -	\$ (612,802)	\$ (612,802)	-	-	-	-	-
Residential	\$ 7,004,790	\$ 4,516,414	64%	0.01	0.01	0.01	\$ 10,830	\$ (4,379,447)	\$ (4,496,492)	0.12	1.58	-	-	-
Cross-Cutting	\$ 19,428,935	\$ 17,960,354	92%	-	-	-	\$ -	\$ (8,435,316)	\$ (8,435,316)	-	-	-	-	-
Market Support Subtotal	\$ 30,359,871	\$ 24,462,992	81%	0.00	0.00	0.00	\$ 10,830	\$ (14,800,986)	\$ (14,918,032)	0.12	1.58	-	-	-
Equity														
Agricultural	\$ -	\$ -	0%	-	-	-	\$ -	\$ -	\$ -	-	-	-	-	-
Commercial	\$ 5,297,422	\$ 13,470	0%	-	-	-	\$ -	\$ (13,470)	\$ (13,470)	-	-	-	-	-
Industrial	\$ -	\$ -	0%	-	-	-	\$ -	\$ -	\$ -	-	-	-	-	-
Public	\$ -	\$ -	0%	-	-	-	\$ -	\$ -	\$ -	-	-	-	-	-
Residential	\$ 7,393,500	\$ 584,586	8%	-	-	-	\$ -	\$ (584,586)	\$ (584,586)	-	-	-	-	-
Cross-Cutting	\$ 614,655	\$ 634,713	103%	-	-	-	\$ -	\$ (634,713)	\$ (634,713)	-	-	-	-	-
Equity Subtotal	\$ 13,305,577	\$ 1,232,769	9%	-	-	-	\$ -	\$ (1,232,769)	\$ (1,232,769)	-	-	-	-	-
Portfolio														
Agricultural	\$ 7,091,297	\$ 1,168,933	16%	0.63	0.72	0.72	\$ 814,393	\$ (479,689)	\$ (319,423)	0.81	7.77	0.19	-	-
Commercial	\$ 151,902,979	\$ 65,322,970	43%	0.56	0.68	0.68	\$ 37,364,376	\$ (46,906,298)	\$ (27,627,275)	82.31	798.99	2.20	0.16	0.83
Industrial	\$ 54,174,430	\$ 5,819,884	11%	1.48	1.94	1.94	\$ 11,241,455	\$ 3,650,135	\$ 5,459,027	24.80	125.31	2.93	0.00	0.02
Public	\$ 12,741,980	\$ 2,923,936	23%	0.06	0.29	0.29	\$ 742,971	\$ (10,888,992)	\$ (1,824,905)	1.19	8.15	0.56	0.00	0.01
Residential	\$ 88,986,015	\$ 25,666,795	29%	0.68	0.69	0.70	\$ 17,249,058	\$ (8,595,839)	\$ (8,100,061)	99.46	150.09	13.29	0.06	0.89
Cross-Cutting	\$ 20,578,681	\$ 19,764,394	96%	0.02	0.02	0.02	\$ 310,995	\$ (14,941,982)	\$ (14,151,264)	0.43	3.21	0.05	-	-
Resource Acquisition % of Portfolio Budget	\$ 94,971,150	\$ 26%												
Market Support % of Portfolio Budget	\$ 24,462,992	7%												
Equity % of Portfolio Budget	\$ 1,232,769	0%												
PA Subtotal (excl. EM&V and C&S)	\$ 335,475,381	\$ 120,666,911	36%	0.54	0.66	0.66	\$ 67,723,249	\$ (78,162,664)	\$ (46,563,901)	209.00	1,093.53	19.22	0.22	1.72
CPUC Savings Goal (excl. C&S)										461.00		69.00		
savings as % of CPUC Savings Goal (w/o C&S)										0.45		0.28		
Total EM&V	\$ 16,221,354	\$ 7,216,961	44%											
Codes and Standards	\$ 17,078,491	\$ 20,331,710	119%	3.50	71.03	49.95	\$ 1,444,233,161	\$ 1,031,505,210	\$ 1,423,901,450	1,222.75	15,934.68	234.63		
PA Portfolio Total (excl. C&S)	\$ 351,696,735	\$ 127,883,873	36%	0.52	0.63	0.63	\$ 67,723,249	\$ (85,379,626)	\$ (53,780,862)	209.00	1,093.53	19.22	0.22	1.72
PA Portfolio Total (incl. C&S)	\$ 368,775,226	\$ 148,215,583	40%	2.61	9.29	8.80	\$ 1,511,956,410	\$ 946,125,585	\$ 1,370,120,588	1,431.75	17,028.21	253.85	0.22	1.72
CPUC Savings Goal (incl. C&S)										1,477.00		269.00		
savings as % of CPUC Savings Goal (w/ C&S)										0.97		0.94		
Footnotes:														
(1) This table does not include ESA, ME&O, or for IOUs REN/CCA achievements.														

Section 6: Bill Payer Impacts

Table 6. Average Bill Payer Impacts from Net Savings ⁹¹

T-6 Estimated Billpayer Impacts from Net Savings												
6-1: Energy Savings Used for Bill Savings Calculation												
2023	PA				Additional Savings from REN/CCAs (for IOUs)				Total Energy Savings			
	First Year Net kWh	Lifecycle Net kWh	First Year Net Therm	Lifecycle Net Therm	First Year Net kWh	Lifecycle Net kWh	First Year Net Therm	Lifecycle Net Therm	First Year Net kWh	Lifecycle Net kWh	First Year Net Therm	Lifecycle Net Therm
Estimated Rate Agriculture	807,236	7,773,918	0	0	0	0	0	0	807,236	7,773,918	0	0
Estimated Rate Commercial	82,306,848	798,990,486	160,629	833,995	0	0	0	0	82,306,848	798,990,486	160,629	833,995
Estimated Rate Industrial	24,801,428	125,312,482	-2,960	-18,931	0	0	0	0	24,801,428	125,312,482	-2,960	-18,931
Estimated Rate Public	1,191,267	8,152,816	3,603	11,664	3,353,770	27,065,818	0	0	4,545,037	35,218,634	3,603	11,664
Estimated Rate Residential	99,458,514	150,087,878	62,664	894,161	4,822,640	53,715,054	0	0	104,281,153	203,802,932	62,664	894,161
Estimated Cross-Cutting	1,223,182,415	15,937,893,231	0	0	0	0	0	0	1,223,182,415	15,937,893,231	0	0
Total	1,431,747,708	17,028,210,810	223,937	1,720,890	8,176,410	80,780,872	0	0	1,439,924,118	17,108,991,682	223,937	1,720,890

6-2: Estimated Bill Savings								
2023	Electric Average Rate \$/kWh	Gas Average Rate \$/therm	Estimated First Year Bill Savings Electric (\$)	Estimated Lifecycle Bill Savings Electric (\$)	Estimated First Year Bill Savings Gas (\$)	Estimated Lifecycle Bill Savings Gas (\$)	Estimated First Year Bill Savings (\$)	Estimated Lifecycle Bill Savings (\$)
Estimated Rate Agriculture	\$0.2035	\$0.0000	\$164,299	\$1,582,253	\$0	\$0	\$164,299	\$1,582,253
Estimated Rate Commercial	\$0.2105	\$0.0000	\$17,328,676	\$168,217,441	\$0	\$0	\$17,328,676	\$168,217,441
Estimated Rate Industrial	\$0.1345	\$0.0000	\$3,335,685	\$16,853,986	\$0	\$0	\$3,335,685	\$16,853,986
Estimated Rate Public	\$0.2017	\$0.0000	\$916,947	\$7,105,250	\$0	\$0	\$916,947	\$7,105,250
Estimated Rate Residential	\$0.2476	\$0.0000	\$25,822,569	\$50,466,600	\$0	\$0	\$25,822,569	\$50,466,600
Estimated Cross-Cutting	\$0.2017	\$0.0000	\$246,773,249	\$3,215,420,405	\$0	\$0	\$246,773,249	\$3,215,420,405
Total			\$294,341,425	\$3,459,645,935	\$0	\$0	\$294,341,425	\$3,459,645,935

Notes: (Consistent with SPM TRC/PAC/RIM tests, all savings used from actuals and forecasts in this table are net not gross)

- Estimated first year electric bill savings is calculated by multiplying an Estimated electric rate (as of 12/1/22) with first year net kWh energy savings.
- Estimated first year gas bill savings is calculated by multiplying an Estimated gas rate (as of 12/31/21) with first year net therm energy savings. Gas rate reflects the annual Estimated residential bundled rate for 2022.
- Total Estimated first year bill savings is the sum of Notes 1 and 2.
- Estimated lifecycle electric bill savings is calculated by multiplying an Estimated electric rate with lifecycle net kWh energy savings.
- Estimated lifecycle gas bill savings is calculated by multiplying an Estimated gas rate with lifecycle net therm energy savings.
- Total Estimated lifecycle bill savings is the sum of Notes 4 and 5.
- Total Estimated Bill Savings by Year and Lifecycle Bill Savings include C&S net savings and net lifecycle savings, respectively, and include BayREN, MCE, 3C-REN, RCEA, SJCE, EBCE, PCE, and SCP savings; excludes ESA Program.

This section provides an explanation of the impact of EE activities on customer bills after they have participated in EE programs, as compared to their bills without EE program participation.

In 2023, SCE was authorized to collect rates to implement approved EE programs. Customer bills included the authorized collection on January 1, 2023, the date the program year began. Therefore, EE programs increase customer bills "up front," as funds are collected to fund the EE programs. However, upon implementation, the programs result in lower customer energy usage due to improvements in EE and subsequent reductions to participants' bills. In the long term, all users will benefit through reductions in the avoided costs of energy. The table provided above shows bill impacts on participating customers in 2023.

⁹¹ The data shown in this Annual Report is based on SCE's *ex ante* savings, adjusted for actual installations, consistent with the *ex ante* values and processes adopted by the Commission.

The following provides a brief explanation of the assumptions used in the calculation:

1. The customer bill impacts included in this report reflect the net impact on bills, accounting for the benefits of the programs.
2. The overall impact of SCE's programs is that customer bills will decrease relative to the level of billing without the EE programs.

The following methodology was utilized for the calculation of bill impacts resulting from the 2023 EE portfolio:

- The calculation methodology for determining average first-year bill savings utilizes the total gross energy savings per year multiplied by the average rate denominated in kWh. The product of these values results in a total bill savings for all program participants.
- Similarly, the calculation methodology for determining average lifecycle bill savings utilizes the total lifecycle gross energy savings multiplied by the average rate denominated in kWh. The product of these numbers results in a total lifecycle bill savings for all program participants.

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Section 7: Savings by End-Use

Table 7. Annual Savings By Use Category⁹²

T-7 Annual Savings By Use Category 2023													
Measure End Use Category	TRC Ratio	PAC Ratio	TSB	Gross GWh		Gross MW	Gross MMTherms		Net GWh		Net MW	Net MMTherms	
				First Year	Life Cycle	First Year	First Year	Life Cycle	First Year	Life Cycle	First Year	First Year	Life Cycle
Appliance or Plug Load	1.86	109.90	\$ 52,204,863.91	249.47	2,004.54	47.14	0.00	0.00	93.54	669.95	17.51	0.00	0.00
Building Envelope	1.95	290.67	\$ 138,652,014.63	95.70	1,703.89	33.04	-	-	58.11	1,021.55	21.51	-	-
Compressed Air	2.53	29.73	\$ 2,353,879.22	6.16	92.35	-	-	-	2.07	31.08	-	-	-
Commercial Refrigeration	2.99	6.62	\$ 60,344,997.28	279.28	2,146.64	41.53	0.27	1.42	96.77	792.77	13.03	0.17	0.92
Codes & Standards	5.13	228.02	\$ 122,574,505.41	598.20	9,981.56	98.62	-	-	102.51	1,601.00	13.25	-	-
Food Service	1.33	5.98	\$ 15,127,988.36	35.62	672.09	60.82	-	-	10.48	188.40	15.98	-	-
HVAC	2.93	11.27	\$ 204,323,357.20	366.26	5,730.27	148.20	0.05	0.73	139.57	2,058.13	51.22	0.05	0.73
Irrigation	0.30	0.35	\$ 194,537.86	1.00	5.22	0.57	-	-	0.35	1.83	0.20	-	-
Lighting	5.63	72.24	\$ 614,102,681.09	2,479.53	27,612.47	213.46	- 0.02	- 0.14	653.20	8,172.94	68.88	- 0.02	- 0.10
Non-Savings Measure	-	-	\$ -	-	-	-	-	-	-	-	-	-	-
Process Distribution	0.21	0.74	\$ 1,374,677.60	2.58	20.49	0.15	-	-	1.69	13.17	0.10	-	-
Process Drying	-	-	\$ -	-	-	-	-	-	-	-	-	-	-
Process Heat	7.75	293.76	\$ 3,076,013.01	0.18	2.70	-	-	-	0.13	1.94	-	-	-
Process Refrigeration	-	-	\$ -	-	-	-	-	-	-	-	-	-	-
Recreation	4.23	495.58	\$ 10,328,219.97	27.30	294.42	6.55	-	-	13.59	148.80	2.86	-	-
Service	1.13	1.13	\$ 11,563,716.13	88.74	88.74	10.87	-	-	93.17	93.17	11.41	-	-
Service and Domestic Hot Water	1.41	2.10	\$ 109,145,915.16	76.93	765.09	3.16	-	-	68.25	676.75	1.75	-	-
Whole Building	1.67	19.94	\$ 166,589,043.53	162.89	2,778.13	70.09	0.02	0.24	98.33	1,556.72	36.16	0.01	0.18
TOTAL	2.61	9.29	\$ 1,511,956,410.36	4,469.83	53,898.61	734.22	0.32	2.25	1,431.75	17,028.21	253.85	0.22	1.72

The Commission's EE reporting requirements mandate that SCE submit regular reports to the Commission quantifying the accomplishments of the portfolio. One such requirement, reporting portfolio performance of energy savings and demand reduction by end use, is reported on a regular basis as part of SCE's monthly report. The table above illustrates the 2023 results, by end use, of SCE's portfolio of EE programs.

⁹² The data shown in this Annual Report is based on SCE's *ex ante* savings, adjusted for actual installations, consistent with the *ex ante* values and processes adopted by the CPUC in D.11-07-030 and subsequent decisions and resolutions.

Section 8: Commitments

The amounts shown in this table include dollar amounts reserved for, and energy savings expected from, projects and/or contracts that SCE entered into during the relevant budget years and that remain to be paid out after 2023. These figures do not include any commitments for Regional Energy Network (REN) funding or Evaluation, Measurement & Verification (EM&V) funding.

Table 8. Commitments ⁹³

Commitments Remaining from Past Year with Expected Implementation after December 2023				
	Committed Funds	Expected Energy Savings		
2010-2012	\$	GWh	MW	MmTherms
Resource	\$ -	-	-	-
Non-Resource	\$ -	-	-	-
Codes & Standards	\$ -	-	-	-
SCE Total	\$ -	-	-	-
-				
Commitments Remaining from Past Year with Expected Implementation after December 2023				
	Committed Funds	Expected Energy Savings		
2013-2015	\$	GWh	MW	MmTherms
Resource	\$ 51,206.19	0.28	0.03	-
Non-Resource	\$ 0.20	-	-	-
Codes & Standards	\$ -	-	-	-
SCE Total	\$ 51,206.39	0.28	0.03	-
-				
Commitments Remaining from Past Year with Expected Implementation after December 2023				
	Committed Funds	Expected Energy Savings		
2016	\$	GWh	MW	MmTherms
Resource	\$ -	-	-	-
Non-Resource	\$ -	-	-	-
Codes & Standards	\$ -	-	-	-
SCE Total	\$ -	-	-	-
-				
Commitments Remaining from Past Year with Expected Implementation after December 2023				
	Committed Funds	Expected Energy Savings		
2017	\$	GWh	MW	MmTherms
Resource	\$ -	-	-	-
Non-Resource	\$ 762,611.81	-	-	-
Codes & Standards	\$ -	-	-	-
SCE Total	\$ 762,611.81	-	-	-

Table continues on the next page

⁹³ *Id.*

(Table 8, continued)

Commitments Made in the Past Year with Expected Implementation after December 2018				
	Committed Funds	Expected Energy Savings		
2018	\$	GWh	MW	MmTherms
Resource	\$ -	-	-	-
Non-Resource	\$ 110,467.05	-	-	-
Codes & Standards	\$ -	-	-	-
[PA] Total	\$ 110,467.05	-	-	-
Commitments Made in the Past Year with Expected Implementation after December 2019				
	Committed Funds	Expected Energy Savings		
2019	\$	GWh	MW	MmTherms
Resource	\$ 466,434.27	1.15	0.12	0.00
Non-Resource	\$ 909,160.83	-	-	-
Codes & Standards	\$ -	-	-	-
[PA] Total	\$ 1,375,595.10	1.15	0.12	0.00
Commitments Made in the Past Year with Expected Implementation after December 2020				
	Committed Funds	Expected Energy Savings		
2020	\$	GWh	MW	MmTherms
Resource	\$ 753,151.04	3.49	0.45	(0.00)
Non-Resource	\$ 244,585.35	-	-	-
Codes & Standards	\$ -	-	-	-
[PA NAME] Total	\$ 997,736.39	3.49	0.45	(0.00)
Commitments Made in the Past Year with Expected Implementation after December 2021				
	Committed Funds	Expected Energy Savings		
2021	\$	GWh	MW	MmTherms
Resource	\$ 660,424.97	2.77	0.27	0.01
Non-Resource	\$ 1,623,423.21	-	-	-
Codes & Standards	\$ 221,816.00	-	-	-
[PA NAME] Total	\$ 2,505,664.18	2.77	0.27	0.01
Commitments Made in the Past Year with Expected Implementation after December 2022				
	Committed Funds	Expected Energy Savings		
2022	\$	GWh	MW	MmTherms
Resource	\$ 523,248.92	3.15	0.18	0.00
Non-Resource	\$ 2,835,109.50	-	-	-
Codes & Standards	\$ 1,841,190.00	-	-	-
[PA NAME] Total	\$ 5,199,548.42	3.15	0.18	0.00
Commitments Made in the Past Year with Expected Implementation after December 2023				
	Committed Funds	Expected Energy Savings		
2023	\$	GWh	MW	MmTherms
Resource	\$ 820,703.23	3.47	4.81	-
Non-Resource	\$ 4,944,245.99	-	-	-
Codes & Standards	\$ 7,867,533.00	-	-	-
[PA NAME] Total	\$ 13,632,482.22	3.47	4.81	-
[1] Does not include commitments for 3C-REN, SoCalREN and I-REN, EM&V or OBF				
[2] 2019 excludes \$3M unspent uncommitted funds set aside for CLEAR projects per AL 3993-E, AL 4430-E				
[3] 2023 includes SW Commitments (SCE portion)				

Section 9: Cap and Target Expenditures

Table 9. 2023 EE Quarterly Cap and Target Expenditure Performance

T-9 2023 Energy Efficiency Quarterly Cap And Target Expenditure Performance								
Energy Efficiency Cap and Target Expenditure Report [2]								
Line	Budget Category	Expenditures[5]			One-Year Authorized IOU Budget	Cap & Target Performance		
		Non-Third-Party Qualifying Costs	Third-Party Qualifying Costs [1]	Total Portfolio		Percent of Budget	Cap %	Target %
1	Administrative Costs	\$10,743,828	\$5,429,122	\$16,172,951	\$35,305,295			
2	IOU	\$7,963,797		\$7,963,797		2.2%	10.0%	
3	Third Party & Partnership	\$26,590	\$5,429,122	\$5,455,712		1.5%		10.0%
4	Target Exempt IOU Programs	\$2,753,442	\$0	\$2,753,442				
5	Marketing and Outreach Costs	\$1,691,669	\$4,098,524	\$5,790,192	\$18,122,620			
6	Marketing & Outreach	\$1,691,669	\$4,098,524	\$5,790,192		1.6%		6.0%
7	Statewide Marketing & Outreach [3]	\$0	\$0	\$0				
8	Direct Implementation Costs	\$55,638,231	\$63,397,247	\$119,035,479	\$299,125,957			
9	Direct Implementation (Incentives and Rebates) [7]	\$9,756,856	\$42,646,633	\$52,403,490				
10	Direct Implementation (Non Incentives and Non Rebates) [6] [7]	\$21,448,749	\$9,906,246	\$31,354,995		8.5%		20.0%
11	Direct Implementation Target Exempt Programs	\$24,432,626	\$10,844,368	\$35,276,994				
12	EM&V Costs (Investor Owned Utilities & Energy Division)	\$7,216,961	\$0	\$7,216,961	\$16,221,354	2.0%	4.0%	
13	Total	\$75,290,690	\$72,924,893	\$148,215,583				
14	2023 Authorized Budget [4]				\$368,775,226			
15	Third-Party Implementer Contracts (as defined per D.16-08-019, OP 10)		\$72,924,893	\$72,924,893	\$245,404,349	19.8%		

[1] Includes SW programs, PA costs, and old-definition 3P/GP contracts that don't meet the new definition.
[2] - Includes all Energy Efficiency Program expenditures & incentives incurred & claimed during 2023 except SW Market Transformation & Summer Reliability, 3C REN, SoCalREN and IREN
[3] - Statewide Marketing, Education & Outreach - No EE Budget as of 2023
[4] - EE Portfolio Budget excludes: Program and EM&V budget for REN Programs; \$14M Finance Revolving Loan Program; \$74.7M AB841 budget
[5] - \$5,243,350 Pensions & Benefits were excluded from the program spent, not funded by the EE Portfolio
[6] - Includes Non Incentives vendor payment for SCE-13-SW-001A Residential Energy Advisor, Resource program
[7] - This report is updated with any adjustments made for SCE's 2022 Annual Report

The Cap and Target Expenditures Report table details whether program budgets in each category (Administrative Costs, Marketing and Outreach, Direct Implementation, and Evaluation, Measurement and Verification [EM&V]) exceed the percentage caps and targets.

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Section 10: Metrics

A copy of SCE's Metrics is available on the California Energy Data and Reporting System (CEDARS) home page, available at:

<https://cedars.sound-data.com/documents/standalone/list/>

The metrics can be found in the document titled SCE_2023_Annual_Report_Appendices, on Tab T-1 BP Metrics.

In D.18-05-041,⁹⁴ the Commission directed Program Administrators to:

- Report progress toward all metrics and indicators⁹⁵ and report metrics and targets, using the updated definition of disadvantaged communities and hard-to-reach customers in the Decision, and
- Assess the relative success of implementers' strategies, for purposes of identifying lessons learned and best practices for maximizing the contribution of energy efficiency in disadvantaged communities, and include this assessment as part of their metrics in their EE Annual Report.⁹⁶

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⁹⁴ D.18-05-041 *Addressing EE Business Plans*.

⁹⁵ *Id.*, OP 9.

⁹⁶ *Id.*, OP 11.

Section 11: Local Program & Statewide Program Third-Party Budgets

See *Tables C-1, C-2, and C-3 in Appendix C, Statewide and Third Party-Implemented Programs*, below.

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Section 12: Third-Party Contracts

Table 12. Third-Party Contracts ^{97, 98}

T-12 Third-Party Contracts													
Program ID	Program Name	Counterparty	Primary Sector (Market Segment)	Sub-Segment	Market Size	Types of Customers	Delivery Channel	Length (Duration, in months)	Contract Start Date ¹	Contract End Date	Program Start Date ²	Program End Date ³	Contract Dollar Value
SCE_3P_2020RCI_001	Marketplace	ENERVEE CORPORATION	Residential	N/A	N/A	Single Family, Multi-Family	Downstream	To Be Determined	9/30/2020	Ongoing until contractual obligations complete.	12/31/2023	1/1/2026	\$ 11,990,962.00
SCE_3P_2020RCI_003	Commercial Behavioral Program	ICF RESOURCES, LLC	Commercial	N/A	N/A	Retail, Office, Restaurants, Grocery, Warehouse, Refrigerated Warehouses, Technology Industries, Lodging, Miscellaneous NAICs Codes	Downstream	To Be Determined	9/30/2020	Ongoing until contractual obligations complete.	Not Started	12/31/2027	\$ 6,530,297.00
SCE_3P_2020RCI_004	Comprehensive Multifamily Program	WILLDAN ENERGY SOLUTIONS	Residential	N/A	N/A	Multifamily	Downstream	58	9/29/2020	Ongoing until contractual obligations complete.	1/28/2022	11/28/2026	\$ 82,170,000.00
SCE_3P_2020RCI_005	Comprehensive Commercial Program	WILLDAN ENERGY SOLUTIONS	Commercial	N/A	N/A	Warehouses / Refrigerated Warehouses, Retail, Technology Industries, Office, Office / Miscellaneous, Miscellaneous, Lodging / Restaurants / Grocery Stores	Downstream	58	9/30/2020	Ongoing until contractual obligations complete.	1/28/2022	11/28/2026	\$ 141,654,000.00
SCE_3P_2020RCI_006	Comprehensive Industrial Program	WILLDAN ENERGY SOLUTIONS	Industrial	N/A	N/A	Mining, Utilities, Construction, Manufacturing, Wholesale Trade, Transportation and Warehousing, Other Services (except Public Administration)	Downstream	55	9/29/2020	Ongoing until contractual obligations complete.	5/25/2022	12/25/2026	\$ 155,000,000.00
SCE_3P_2021AGPUB_001	Agriculture Energy Efficiency Program	ICF RESOURCES, LLC	Agricultural	N/A	N/A	Controlled Environment Agriculture, Dairy Animal Production, Non-Dairy Production, Non-Dairy Animal Production, Cold Storage and Post-Harvest Processing, Irrigated Crops	Downstream	To Be Determined	12/15/2021	Ongoing until contractual obligations complete.	7/31/2023	12/31/2025	\$ 11,499,813.00
SCE_3P_2021AGPUB_002	Public Energy Performance Program	CLEARRESULT CONSULTING INC.	Public	N/A	N/A	Local Government, Schools, Federal and Tribal Government	Downstream	To Be Determined	12/15/2021	Ongoing until contractual obligations complete.	12/31/2023	12/31/2025	\$ 22,762,103.00
SCE Res Equity 001	Residential Energy Advisor (Resource)	CLEARRESULT CONSULTING INC.	Residential	N/A	N/A	Single-Family Customer, Multi-Family Customer, Hard-to-Reach Customer, Disadvantaged Community, or Underserved Community	Downstream	To Be Determined	3/31/2023	Ongoing until contractual obligations complete.	Not Started	12/31/2025	\$ 8,381,556.00
SCE Res Equity 002	Residential Energy Advisor (Non-Resource)	CLEARRESULT CONSULTING INC.	Residential	N/A	N/A	Hard-to-Reach Customer, Disadvantaged Community, or Underserved Community	N/A	To Be Determined	3/31/2023	Ongoing until contractual obligations complete.	Not Started	12/31/2025	\$ 3,896,028.00
SCE Res Equity 003	Disadvantaged Communities Marketing and Outreach	GLOBAL ENERGY SERVICES INC.	Residential	N/A	N/A	Hard-to-Reach Customer, Disadvantaged Community, or Underserved Community	Downstream	To Be Determined	3/31/2023	Ongoing until contractual obligations complete.	9/13/2023	12/31/2025	\$ 4,275,000.00
SCE SMB Equity 001	Simplified Savings	RESOURCE INNOVATIONS INC.	Non-residential	N/A	N/A	Public, Agriculture, Commercial, and Industrial Small/Medium Business Customers, Hard-to-Reach Customer, Disadvantaged Community, or Underserved Community with < 200 kW in peak demand	Downstream	To Be Determined	5/22/2023	Ongoing until contractual obligations complete.	Not Started	9/1/2026	\$ 14,551,739.00
SCE_SW_ETP_Elec	Emerging Technologies Program, Electric	Cohen Ventures, Inc.	Residential, Commercial, Industrial, Agricultural, Public	N/A	N/A	Customers who receive electric service from a California electric investor-owned utility.	N/A	68	9/14/2021	Ongoing until contractual obligations complete.	5/25/2022	12/31/2027	\$ 67,533,849.00
SCE_SW_IP_Colleges	Institutional Partnerships, UC/CSU/CCC	ClearResult Consulting Inc.	Higher Education Institution	N/A	N/A	UC, CSU Campuses, CCC Campuses	Downstream	To Be Determined	2/9/2022	Ongoing until contractual obligations complete.	Not Started	12/31/2025	\$ 12,571,286.00
SCE_SW_UL	CA Statewide Lighting Program	TRC Solutions Inc.	Commercial and Industrial	N/A	N/A	Mining, Quarrying, and Oil and Gas Extraction, Utilities, Construction, Manufacturing, Wholesale Trade, Retail Trade, Transportation and Warehousing, Information, Finance and Insurance, Real Estate Rental and Leasing, Professional, Scientific, and Technical Services, Management of Companies and Enterprises, Administrative and Support and Waste Management and Remediation Services, Educational Services, Health Care and Social Assistance, Arts, Entertainment, and Recreation, Other Services, Public Administration	Midstream	21	9/30/2020	6/30/2023 ⁴	10/1/2021	6/30/2023	\$ 36,000,000.00
SCE_SW_WP	Water/Wastewater Pumping	Lincus Inc.	Water/Wastewater Pumping Customer	N/A	N/A	Farming, Groves, Vineyards, Orchards, Animal Aquaculture, Fish Hatcheries, Marine Products, Crude Petroleum, Natural Gas, Natural Gas Liquids, Industrial Inorganic Chemicals, Oil and Gas Exploration/Field Services, Water, Steam and Air-conditioning Supply, Irrigation Systems, Water, Sewer, and Utility Lines, Water Well Drilling, Air and Gas Compressors, Pumps and Pumping Equipment, Measuring and Dispensing Pumps, Pipelines	Downstream	To Be Determined	4/28/2022	Ongoing until contractual obligations complete.	12/31/2023	8/31/2027	\$ 15,567,814.00

1. Contract Start Date is defined as the Effective Date of the Agreement.
2. Program Start Date is defined as the IDD (if implementer has reached IDD) or date first project was approved by SCE or 12/31/2023 if project was subsequently approved for 2023 (if implementer has not reached IDD).
3. Program End Date is dependent upon achievement of IDD. Program End Date is actual where implementer has reached IDD and estimated where implementer has not reached IDD. Program end dates are based on current contract terms and may be extended through amendments.
4. CA Statewide Lighting Program [SCE_SW_UL] Due to the lower incentives and increased costs, TRC Solutions determined the financial viability of the program was unsustainable and SCE and TRC mutually decided to terminate the Statewide Lighting contract.
5. Length (duration in months) is based on IDD through the end of delivery period. If IDD has not been met, SCE cannot calculate the exact "Length" and has noted "To Be Determined".

⁹⁷ Per D.18-05-041, OP 17, *Addressing EE Business Plans*, "The investor-owned utilities must track the number and proportion of third parties that forego the option of using utility account representatives. The utilities must include this information in their annual reports." All (100%) of SCE's third-party implementers have foregone this option.

⁹⁸ Note that in the future, contract dates and dollar amounts may be amended.

Section 13: Final EE Monthly Report

To obtain a copy of SCE's December 2023 EE Monthly Report, please visit the California Public Utilities Commission – California Energy Data and Reporting System (CEDARS), available at <https://cedars.sound-data.com/monthly-reports/confirmed-dashboard/SCE/>.

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Appendix B.

Southern California Edison Programs

Table B-1: Historical and Current SCE 2023 EE Portfolio Programs

CPUC Program ID	Program Name	Start Year ⁹⁹	End Year
SCE_Res_Equity_002	CLEAResult Residential Energy Advisor Non-Resource Equity Programs	2023	N/A
SCE_Res_Equity_001	CLEAResult Residential Energy Advisor Resource Equity Programs	2023	N/A
SCE_Res_Equity_003	Global Energy Services Disadvantaged Community Marketing Outreach Non-Resource Program	2023	N/A
SCE_SMB_Equity_001	Resource Innovations Small Medium Business Equity (Simplified Savings) Program	2023	N/A
SCE_SW_WP	Statewide Water Infrastructure & System Efficiency Program	2023	N/A
SCE_SW_IP_Colleges	Statewide Higher Education Energy Efficiency Program	2022	N/A
SCE_SR_001	Summer Reliability Program (Market Access Program)	2022	N/A
SCE_3P_2021AGPUB_001	Agriculture Energy Efficiency Program	2021	N/A
SCE-13-TP-029	Public Energy Performance Program	2021	N/A
SCE_SW_ETP_Elec	Statewide Electric Emerging Technologies Program	2021	N/A
SCE_SW_UL	California Statewide Lighting Program	2021	2023
SCE-3P-2020RCI-003	Commercial Behavioral Program	2020	N/A
SCE-3P_2020_001	Enervue Marketplace Program	2020	N/A
SCE-3P-2020RCI-005	Willdan Commercial Energy Efficiency Program	2020	N/A
SCE-3P-2020RCI-006	Willdan Industrial Energy Efficiency Program	2020	2024
SCE-3P-2020RCI-004	Willdan Multifamily Energy Efficiency Program	2020	2024
SCE-3P-2020RCI-002	Residential Behavioral Program	2020	2022
SCE-13-TP-025	Facility Assessment Services Program	2019	2021
SCE-13-SW-002I	Market Based Incentive Program	2019	2021
SCE-13-SW-008F	National and International Standards	2019	2020
SCE-13-SW-003D	Strategic Energy Management Program	2018	N/A
SCE-13-L-002Y	Grandfathered Street Lights	2018	2022
SCE-13-TP-024	AB793 Residential Pay for Performance Program	2017	N/A
SCE-13-SW-001G	Residential Direct Install Program	2017	N/A
SCE-13-SW-002H	Midstream Point Of Purchase Program	2017	2021

⁹⁹ CPUC-approved program Start Year.

CPUC Program ID	Program Name	Start Year ⁹⁹	End Year
SCE-13-L-003I	Public Sector Performance-Based Retrofit High Opportunity Program	2017	2021
SCE-13-TP-022	Water Infrastructure Systems EE Program (WISE)	2017	2019
SCE-13-TP-023	Midsized Industrial Customer Program (MICE)	2017	2018
SCE-16-L-002X	Water Energy Nexus Program	2016	2020
SCE-13-L-002V	North Orange County Cities Energy Leader Partnership	2015	2022
SCE-13-L-002W	San Bernardino Regional Energy Leader Partnership	2015	2022
SCE-13-SW-002A	Commercial Energy Advisor Program	2013	N/A
SCE-13-SW-008C	Compliance Improvement	2013	N/A
SCE-13-TP-001	Comprehensive Manufactured Homes Program	2013	N/A
SCE-13-SW-001A	Home Energy Advisor Program	2013	N/A
SCE-13-SW-010A	Integrated Energy Education and Training (IEET) Subprogram	2013	N/A
SCE-13-SW-007C	New Finance Offerings	2013	N/A
SCE-13-SW-007A	On-Bill Financing Program	2013	N/A
SCE-13-SW-008E	Planning and Coordination	2013	N/A
SCE-13-SW-008D	Reach Codes	2013	N/A
SCE-13-SW-010B	Workforce Education & Training Program	2013	N/A
SCE-13-SW-009B	Technology Assessment Subprogram	2013	N/A
SCE-13-SW-009A	Technology Development Support (TDS)	2013	N/A
SCE-13-SW-009C	Technology Introduction Support Subprogram	2013	N/A
SCE-13-SW-004B	Agriculture Calculated Energy Efficiency Program	2013	2022
SCE-13-TP-009	Comprehensive Chemical Products Program	2013	2022
SCE-13-L-003	Institutional and Government EE Partnership	2013	2022
SCE-13-SW-001B	Plug Load and Appliances Program	2013	2022
SCE-13-L-002M	San Gabriel Valley Energy Leader Partnership	2013	2022
SCE-13-SW-004C	Agriculture Deemed Energy Efficiency Program	2013	2021
SCE-13-SW-002B	Commercial Calculated Program	2013	2021
SCE-13-SW-002C	Commercial Deemed Incentives Program	2013	2021
SCE-13-SW-003B	Industrial Calculated Energy Efficiency Program	2013	2021
SCE-13-SW-003C	Industrial Deemed Energy Efficiency Program	2013	2021
SCE-13-SW-003A	Industrial Energy Advisor Program	2013	2021
SCE-13-SW-001F	Residential New Construction Program	2013	2021
SCE-13-SW-002G	Savings By Design Program	2013	2021
SCE-13-SWMEO	Statewide Marketing, Education & Outreach Program	2013	2021

CPUC Program ID	Program Name	Start Year ⁹⁹	End Year
SCE-13-SW-004A	Agriculture Energy Advisor Program	2013	2020
SCE-13-SW-008B	Appliance Standards Advocacy	2013	2020
SCE-13-SW-008A	Building Codes and Compliance Advocacy	2013	2020
SCE-13-TP-010	Comprehensive Petroleum Refining Program	2013	2020
SCE-13-L-002I	Energy Leader Partnership Strategic Support	2013	2020
SCE-13-SW-001C	Multifamily Energy Efficiency Rebate Program	2013	2020
SCE-13-TP-008	Nonmetallic Minerals and Products Program	2013	2020
SCE-13-TP-007	Primary and Fabricated Metals Program	2013	2020
SCE-13-SW-002D	Commercial Direct Install Program	2013	2019
SCE-13-TP-021	Enhanced Retro-commissioning Program	2013	2019
SCE-13-SW-005	Lighting Program	2013	2019
SCE-13-SW-005C	Primary Lighting Program, Subprogram of Statewide Lighting Program	2013	2019
SCE-13-TP-018	School Energy Efficiency Program	2013	2019
SCE-13-SW-004D	Agriculture Continuous Energy Improvement Program	2013	2018
SCE-13-SW-007B	ARRA-Originated Financing Program	2013	2018
SCE-13-SW-002E	Commercial Continuous Energy Improvement Program	2013	2018
SCE-13-TP-014	Commercial Utility Building Efficiency (CUBE) Program	2013	2018
SCE-13-TP-002	Cool Planet Program	2013	2018
SCE-13-TP-013	Cool Schools Program	2013	2018
SCE-13-TP-004	Data Center Energy Efficiency Program	2013	2018
SCE-13-SW-001D	Energy Upgrade California	2013	2018
SCE-13-TP-006	Food & Kindred Products Program	2013	2018
SCE-13-TP-003	Healthcare EE Program	2013	2018
SCE-13-TP-020	IDEEA365 Program	2013	2018
SCE-13-SW-003D	Industrial Continuous Energy Improvement Program	2013	2018
SCE-13-SW-006	Integrated Demand Side Management Program	2013	2018
SCE-13-SW-005B	Lighting Innovation Program, Subprogram of Statewide Lighting Program	2013	2018
SCE-13-SW-005A	Lighting Market Transformation Program, Subprogram of Statewide Lighting Program	2013	2018
SCE-13-TP-005	Lodging EE Program	2013	2018
SCE-13-TP-011	Oil Production Program	2013	2018
SCE-13-TP-019	Sustainable Communities Program	2013	2018
SCE-13-SW-010C	WE&T Planning	2013	2018

CPUC Program ID	Program Name	Start Year ⁹⁹	End Year
SCE-13-L-001	Integrated Demand Side Management Pilot for Food Processing	2013	2016
SCE-13-TP-017	Energy Efficiency for Entertainment Centers Program	2013	2015
SCE-13-TP-012	Refinery Energy Efficiency Program	2013	2015
SCE-13-L-002T	West Side Community Energy Leader Partnership	2011	2022
SCE-13-L-002U	Local Government Strategic Planning Pilot Program	2011	2019
SCE-13-L-003A	California Community Colleges EE Partnership	2010	2022
SCE-13-L-002B	City of Long Beach Energy Leader Partnership	2010	2022
SCE-13-L-003C	County of Los Angeles Energy Efficiency Partnership	2010	2022
SCE-13-L-002F	Gateway Cities Energy Leader Partnership	2010	2022
SCE-13-L-002L	Orange County Cities Energy Leader Partnership	2010	2022
SCE-13-L-002N	San Joaquin Valley Energy Leader Partnership	2010	2022
SCE-13-L-002O	South Bay Energy Leader Partnership	2010	2022
SCE-13-L-002R	Western Riverside Energy Leader Partnership	2010	2022
SCE-13-L-003B	California Dept. of Corrections and Rehabilitation EE Partnership	2010	2021
SCE-13-L-003D	County of Riverside Energy Efficiency Partnership	2010	2021
SCE-13-L-003E	County of San Bernardino Energy Efficiency Partnership	2010	2021
SCE-13-L-002J	Desert Cities Energy Leader Partnership	2010	2021
SCE-13-L-002H	Eastern Sierra Energy Leader Partnership	2010	2021
SCE-13-L-002S	High Desert Regional Energy Leader Partnership (formerly City of Adelanto Energy Leader Partnership)	2010	2021
SCE-13-L-002K	Kern County Energy Leader Partnership	2010	2021
SCE-13-L-003F	State of California Energy Efficiency Partnership	2010	2021
SCE-13-L-003G	UC/CSU Energy Efficiency Partnership	2010	2021
SCE-13-L-002C	City of Redlands Energy Leader Partnership (merged with SCE-13-L-002W)	2010	2016
SCE-13-L-002A	City of Beaumont Energy Leader Partnership	2010	2015
SCE-13-L-002E	City of Simi Valley Energy Leader Partnership (merged with SCE-13-L-002Q Ventura)	2010	2015
SCE-13-L-002P	South Santa Barbara County Energy Leader Partnership	2009	2022
SCE-13-L-002Q	Ventura County Energy Leader Partnership	2009	2022
SCE-13-L-002 (Rollup)	Energy Leader Partnership Program	2009	2018
SCE-13-L-002G	Community Energy Leader Partnership	2009	2017
SCE-13-L-002D	City of Santa Ana Energy Leader Partnership (merged with SCE-13-L-002L OCC)	2007	2016

Appendix C.

Statewide and Third Party-Implemented Programs

Third-Party Program Requirements

Per D.18-01-004, the Commission ordered in 2018 that EE portfolio budgets be contracted to third parties using a phased-in approach. To ensure a smooth transition, CPUC set minimum compliance percentage requirements, which increased incrementally to 25%, 40% and, finally, 60% in 2022.

Statewide Third-Party Program Coordination

To allow for the successful implementation of Statewide Programs, all IOUs have engaged in various coordinated efforts. The IOUs have established a coordinated body that meets regularly to coordinate the development of critical infrastructure that will allow the IOUs to implement Statewide Programs in compliance with Commission guidance. All meetings and topics of discussion abide by each utility's antitrust policy.

Statewide Third-Party Program Budgets

On November 15, 2018, San Diego Gas & Electric Company (SDG&E), Southern California Gas Company (SoCalGas), Pacific Gas & Electric Company (PG&E), and SCE filed a Joint Supplemental Advice Letter regarding the IOUs' proposed mechanism for shared funding of statewide programs pursuant to OP 24 of D.18-05-041.¹⁰⁰

In D.18-05-041, the Commission also directed the IOUs to include a summary of key findings from the annual report in their respective annual energy efficiency portfolio reports to the Commission. Specifically, the summary of key findings details proportional funding amounts for each statewide program area, and highlights any IOU cost-sharing discrepancies, with a focus on the requirement for proportional budget contributions.¹⁰¹

Tables C-1 and C-2, starting on the next page, summarize the program budgets for local and statewide third-party programs, respectively. Table C-3 summarizes performance against the 60% requirement for third-party participation. Tables C-4 and C-5 summarize the statewide EE programs currently in operation and identify the Lead IOU for each.

¹⁰⁰ *Joint Supplemental Advice Letter* (SDG&E AL 3268-E-A/2701-G-A; SoCalGas AL 5346-G-A; SCE AL 3861-E-A; and PG&E AL 5373-E-A/4009-G-A).

¹⁰¹ D.18-05-041, *Addressing EE Business Plans*, pp. 86-87.

Table C-1. Local Programs Third-Party Budgets

Program ID	Program Name	Counterparty Name	3P Procurement? (Y/N)*	Sector/Category	Forecasted Annual Budgets				
					2024 ¹	2025 ²	2026 ²	2027 ²	Total
SCE_3P_2020RCI_001	Marketplace	ENERVEE CORPORATION	Y	Residential	\$ 2,647,921	\$ 2,743,458	\$ -	\$ -	\$ 5,391,379
SCE_3P_2020RCI_003	Commercial Behavioral Program	ICF RESOURCES, LLC	Y	Commercial	\$ 705,433	\$ 1,894,593	\$ 2,378,318	\$ 1,551,953	\$ 6,530,297
SCE_3P_2020RCI_004	Comprehensive Multifamily Program	WILLDAN ENERGY SOLUTIONS	Y	Residential	\$ -	\$ -	\$ -	\$ -	\$ -
SCE_3P_2020RCI_005	Comprehensive Commercial Program	WILLDAN ENERGY SOLUTIONS	Y	Commercial	\$ 25,200,000	\$ 30,240,000	\$ 30,240,000	\$ -	\$ 85,680,000
SCE_3P_2020RCI_006	Comprehensive Industrial Program	WILLDAN ENERGY SOLUTIONS	Y	Industrial	\$ -	\$ -	\$ -	\$ -	\$ -
SCE_3P_2021AGPUB_001	Agriculture Energy Efficiency Program	ICF RESOURCES, LLC	Y	Agriculture	\$ 2,986,185	\$ 3,001,144	\$ -	\$ -	\$ 5,987,329
SCE_3P_2021AGPUB_002	Public Energy Performance Program	CLEARRESULT CONSULTING INC.	Y	Public	\$ 1,358,345	\$ 4,563,215	\$ 8,221,659	\$ -	\$ 14,143,219
SCE_Res_Equity_001	Residential Energy Advisor (Resource)	CLEARRESULT CONSULTING INC.	Y	Residential	\$ 3,336,513	\$ 3,298,194	\$ -	\$ -	\$ 6,634,707
SCE_Res_Equity_002	Residential Energy Advisor (Non-Resource)	CLEARRESULT CONSULTING INC.	Y	Residential	\$ 1,650,986	\$ 1,822,840	\$ -	\$ -	\$ 3,473,826
SCE_Res_Equity_003	Disadvantaged Communities Marketing and Outreach	GLOBAL ENERGY SERVICES INC.	Y	Residential	\$ 1,849,232	\$ 1,855,769	\$ -	\$ -	\$ 3,705,001
SCE_SMB_Equity_001	Simplified Savings	RESOURCE INNOVATIONS INC.	Y	Commercial	\$ 5,124,188	\$ 7,736,250	\$ 575,469	\$ -	\$ 13,435,907
SCE_3P_SEM_001	Commercial Energy Manager Program ^{3,4}	Multiple	Y	Commercial	\$ -	\$ 11,370,622	\$ 11,233,871	\$ 16,936,287	\$ 39,540,780
SCE_3P_SEM_002	Industrial and Agricultural Energy Management Program ^{3,4}	Multiple	Y	Industrial	\$ -	\$ 9,241,693	\$ 11,721,048	\$ 17,500,395	\$ 38,463,136
SCE-13-TP-026	Residential 3P Solicitation ³	TBD	Y	Residential	\$ -	\$ 7,287,907	\$ 16,292,521	\$ 16,292,521	\$ 39,872,948
SCE-13-TP-027	Commercial 3P Solicitation ³	TBD	Y	Commercial	\$ -	\$ 25,480,129	\$ 35,122,237	\$ 35,128,745	\$ 95,731,111
SCE-13-TP-028	Industrial 3P Solicitation ³	TBD	Y	Industrial	\$ -	\$ 30,833,149	\$ 30,833,149	\$ 38,541,436	\$ 100,207,734
SCE-13-TP-029	Local Public Sector 3P Solicitation ³	TBD	Y	Public	\$ -	\$ -	\$ -	\$ 4,563,215	\$ 4,563,215
SCE-13-TP-030	Agricultural 3P Solicitation ³	TBD	Y	Agriculture	\$ -	\$ -	\$ 3,001,144	\$ 3,001,144	\$ 6,002,288
									\$ -
				Total	\$ 44,858,803	\$ 141,368,963	\$ 149,619,416	\$ 133,515,695	\$ 469,362,877

* (Y) if the program was procured through the third-party solicitation process, (N) if program existed prior to the establishment of the process. Third Party Procurement is defined in D.16-08-019, Ordering Paragraph 10.

¹Forecasted budget for programs that were under contract on December 31st, 2023. Deviations from the amount filed should be footnoted

²Forecasted budget for programs that are expected to be under contract (or are already under contract) for each program year by December 31st of the previous year. Deviations from the amount filed should be footnoted

³These contracts are future solicitation amounts expected for 2024 but were not under contract by 12/31/23. A total budget of \$19,027,774 of approved budget was removed from 2024 and added to 2027

⁴These contracts are future solicitation amounts expected for 2025 and beyond

Table C-2. Statewide Programs Third-Party Budgets

Program ID	Program Name	Counterparty Name	Lead IOU	Sector/Category	Forecasted Annual Budget					Pro Rata Share (%)	IOU Share of Forecasted Annual Budget				
					2024 ¹	2025 ²	2026 ²	2027 ²	Total		2024 ¹	2025 ²	2026 ²	2027 ²	Total
SW_CSA_Appl	State Appliance Standards Advocacy	Multiple	PG&E	Codes and Standards	\$ 4,248,447	\$ 2,798,447	\$ 2,348,447	\$ 3,998,447	\$ 13,393,788	36.29%	\$ 1,541,761	\$ 1,015,556	\$ 852,251	\$ 1,451,036	\$ 4,860,606
SW_CSA_Bldg	State Building Codes Advocacy	Multiple	PG&E	Codes and Standards	\$ 8,149,584	\$ 9,599,584	\$ 10,049,584	\$ 8,399,584	\$ 36,198,336	36.29%	\$ 2,957,484	\$ 3,483,689	\$ 3,646,994	\$ 3,048,209	\$ 13,136,376
SW_CSA_Natl	National Codes & Standards Advocacy	Multiple	PG&E	Codes and Standards	\$ 5,088,827	\$ 5,088,827	\$ 5,088,827	\$ 5,088,827	\$ 20,355,308	36.29%	\$ 1,846,735	\$ 1,846,735	\$ 1,846,735	\$ 1,846,735	\$ 7,386,941
SW_IP_Gov	Institutional Partnerships: DGS and DoC	Alternative Energy Systems Consulting, Inc.	PG&E	Public	\$ 3,867,166	\$ 3,646,994	\$ 3,633,565	\$ 3,910,591	\$ 15,058,315	49.75%	\$ 1,923,915	\$ 1,814,379	\$ 1,807,699	\$ 1,945,519	\$ 7,491,512
SW_NC_NonRes_electric	SW New Construction NonRes - All Electric	Willdan Energy Solutions	PG&E	Commercial	\$ 12,530,007	\$ 17,361,054	\$ 16,058,889	\$ 16,058,889	\$ 62,008,839	62.19%	\$ 7,792,411	\$ 10,796,839	\$ 9,987,023	\$ 9,987,023	\$ 38,563,297
SW_NC_NonRes_mixed	SW New Construction NonRes - Mixed Fuel	Willdan Energy Solutions	PG&E	Commercial	\$ 11,630,007	\$ 11,574,036	\$ 8,595,279	\$ 8,595,279	\$ 40,394,601	49.75%	\$ 5,785,928	\$ 5,758,083	\$ 4,276,152	\$ 4,276,152	\$ 20,096,314
SW_NC_Res_electric	SW New Construction Res - All Electric	TRC SOLUTIONS INC	PG&E	Residential	\$ 12,846,232	\$ 13,949,284	\$ 13,950,180	\$ 12,339,759	\$ 53,085,456	62.19%	\$ 7,989,072	\$ 8,675,060	\$ 8,675,617	\$ 7,674,096	\$ 33,013,845
SW_WET_CC	WET Career Connections	The Energy Coalition	PG&E	WE&T	\$ 1,100,000	\$ 1,100,000	\$ 1,100,000	\$ 1,100,000	\$ 4,400,000	49.75%	\$ 547,250	\$ 547,250	\$ 547,250	\$ 547,250	\$ 2,189,000
SW_WET_Work	WET Career and Workforce Readiness	Strategic Energy Solutions	PG&E	WE&T	\$ 2,200,000	\$ 2,200,000	\$ 2,200,000	\$ 2,200,000	\$ 8,800,000	49.75%	\$ 1,094,500	\$ 1,094,500	\$ 1,094,500	\$ 1,094,500	\$ 4,378,000
SW_ETP_Elec	Emerging Technologies Program, Electric	Cohen Ventures, Inc.	SCE	Emerging Tech	\$ 17,819,947	\$ 17,896,999	\$ 17,896,999	\$ 17,896,999	\$ 71,510,944	62.19%	\$ 11,082,225	\$ 11,130,144	\$ 11,130,144	\$ 11,130,144	\$ 44,472,656
SW_IP_Colleges	Institutional Partnerships, UC/CSU/CCC	ClearResult Consulting Inc.	SCE	Public	\$ 2,301,563	\$ 3,965,739	\$ 4,408,573	\$ 4,408,573	\$ 15,084,447	49.75%	\$ 1,145,028	\$ 1,972,955	\$ 2,193,265	\$ 2,193,265	\$ 7,504,512
SW_WP	Water/wastewater pumping	Lincus Inc.	SCE	Public	\$ 3,179,846	\$ 3,026,440	\$ 3,275,242	\$ 3,117,234	\$ 12,598,762	49.75%	\$ 1,581,973	\$ 1,505,654	\$ 1,629,433	\$ 1,550,824	\$ 6,267,884
SW_ETP_Gas	Emerging Technologies Program, Gas	ICF Resources, LLC	SoCalGas	Emerging Tech	\$ 3,000,000	\$ 3,000,000	\$ 3,000,000	\$ 3,000,000	\$ 12,000,000	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -
SW_FS	Food Service POS	Energy Solutions	SoCalGas	Commercial	\$ 18,000,000	\$ 18,000,000	\$ 18,000,000	\$ 18,000,000	\$ 72,000,000	24.88%	\$ 4,478,400	\$ 4,478,400	\$ 4,478,400	\$ 4,478,400	\$ 17,913,600
SW_MCWH	Midstream Comm Water Heating	DNV GL Energy Services USA, Inc.	SoCalGas	Commercial	\$ 15,000,000	\$ 15,000,000	\$ 15,000,000	\$ 15,000,000	\$ 60,000,000	24.88%	\$ 3,732,000	\$ 3,732,000	\$ 3,732,000	\$ 3,732,000	\$ 14,928,000
SW_HVAC_Up	Upstream HVAC (Comm)3	CLEARresult Inc.	SDG&E	Commercial and Resid	\$ 13,599,163	\$ 14,215,240	\$ 14,888,398	\$ 15,594,615	\$ 58,297,416	49.75%	\$ 6,765,584	\$ 7,072,082	\$ 7,406,978	\$ 7,758,321	\$ 29,002,964
SW_PLA	Plug Load and Appliance3	CLEARresult Inc.	SDG&E	Residential	\$ 13,513,825	\$ 12,634,925	\$ 9,255,471	\$ 9,017,362	\$ 44,421,584	49.75%	\$ 6,723,128	\$ 6,285,875	\$ 4,604,597	\$ 4,486,138	\$ 22,099,738
SW_HVAC_QIQM	SW Residential HVAC Quality Installation Quality Maintenance	Frontier Energy Inc.	SDG&E	Residential	\$ 8,147,873	\$ 8,290,061	\$ 6,928,242	\$ 6,900,000	\$ 30,266,176	49.75%	\$ 4,053,567	\$ 4,124,305	\$ 3,446,800	\$ 3,432,750	\$ 15,057,423
Total											\$ 71,040,961	\$ 75,333,508	\$ 71,355,838	\$ 70,632,362	\$ 288,362,668

¹Forecasted budget for programs that were under contract on December 31st, 2023. Deviations from the amount filed should be footnoted
²Forecasted budget for programs that are expected to be under contract (or are already under contract) for each program year by December 31st of the previous year. Deviations from the amount filed should be footnoted
³SDG&E Provided budgets different than uploaded in CEDARS and provided a combined number for HVAC Upstream program

Table C-3. 60% Compliance 2024-2027

Component	2024-2027
Local 3P Programs	\$ 469,362,877
Statewide 3P Programs	\$ 288,362,668
Total 3P-Qualified Budget	\$ 757,725,546
Annual Budget	\$ 1,143,059,489
% Third Party Achieved	66%
Requirement	60%
In Compliance (T/F)	TRUE

Statewide Programs

The Commission established Statewide Programs and the associated Lead IOUs¹⁰² in 2018, as summarized in Tables C-4 and C-5 below:

Table C-4. Lead Program Administrator for Statewide Programs

Program Category	Lead IOU
Plug Load and Appliance	SDG&E
HVAC (Upstream Residential, Upstream Commercial)	SDG&E
New Construction (Residential)	PG&E
New Construction (Non-Residential)	PG&E
Codes & Standards (Building Codes Advocacy)	PG&E
Codes & Standards (Appliance Standards Advocacy)	PG&E
Codes & Standards (National Advocacy)	PG&E
Workforce Education & Training (Career Connections)	PG&E
Institutional Partnerships (State of California, California Department of Corrections)	PG&E
Lighting (Program Closed – Webinar July 2023)	SCE
Emerging Technologies (Electric)	SCE
Institutional Partnerships (University of California, California State University), called "Higher Education"	SCE
Emerging Technologies (Gas)	SoCalGas
Foodservice Point of Sale	SoCalGas
Midstream Commercial Water Heating	SoCalGas

Table C-5. Lead Program Administrator for Statewide Downstream Pilot Programs

Program	Lead IOU
HVAC Quality Installation/Quality Maintenance (QI/QM)	SDG&E
Water/Wastewater Pumping Program	SCE
Workforce Education & Training (Career and Workforce Readiness)	PG&E

SCE provides funding to the Lead Program Administrators as shown in Table 3 and Table 4 of D.18-05-041. SCE receives proportional benefits from the Statewide Programs through the CPUC's CEDARS reporting system. Please refer to the Lead Program Administrators' 2023 Energy Efficiency Annual Reports for performance information on their respective Statewide Programs.

¹⁰² D.18-05-041, OP 26.

Appendix D. Regional Energy Networks Joint Cooperation Memoranda

Per Decision (D.) 23-06-055,¹⁰³ which supersedes D.18-05-041 and D.21-05-031 with respect to the timing and submission of Joint Cooperation Memoranda (JCM), Portfolio Administrators must submit JCMs every two years, within 60 days after Commission approval of the last of each JCM's Portfolio Administrator's true-up advice letters and mid-cycle advice letters (as applicable), to the California Energy Data and Reporting System (CEDARS), with notice to the service list of Rulemaking 13-11-005 or a successor proceeding.

To view the JCMs for the Southern California Regional Energy Network (SoCalREN), the Tri-County Regional Energy Network (3C-REN), and the Inland Regional Energy Network (I-REN), use this link: [Joint Cooperation Memos | caeccc](#).

Go on to the next page

¹⁰³ D.21-05-031, *Energy Efficiency Portfolios for 2024-2027*, OP 130.

Appendix E.

List of Acronyms and Abbreviations

Acronym or Abbreviation	Explanation
3C-REN	Tri-County Regional Energy Network
9-12	A program for high schools (see WE&T , below)
AB	Assembly Bill
ABAL	Annual Budget Advice Letter
ABS	Automated Benchmarking System
ACEEE	American Council for an Energy-Efficient Economy
ACM	Alternative Calculation Method
ADUs	Accessory Dwelling Units
AHPC	Advanced Heat Pump Coalition
AHR	Air-Conditioning, Heating, Refrigerating
AHRI	Air Conditioning, Heating and Refrigeration Institute
AIA	American Institute of Architects
aka	also known as
AL	Advice Letter
API	Application Programming Interface
APR	Annual Percentage Rate
ASHRAE	ASHRAE.org, formerly American Society of Heating, Refrigeration, & Air-Conditioning Engineers
ASTM	American Society for Testing and Materials
ATE / ATT	Acceptance Testing Employer / Acceptance Test Technician
AWHI	Advanced Water Heating Initiative
AWHP	Air-to-Water Heat Pump
BACS	Building Automation and Control Systems
BBAL	Bi-Annual Budget Advice Letter
BDC	Building Decarbonization Coalition
BE	Building Electrification
BEM	Building Energy Modeling
BER	Business Energy Report
BETR	Building Electrification Technology Roadmap
BIG	Building Inventory GIS Database
BPS	Building Performance Standards
BRO	Behavioral, Retrocommissioning and Operational
BUGMAP	Bottom Up Grid Model Advanced Profiles

Acronym or Abbreviation	Explanation
C&S	Codes and Standards
C/E	Cost-Effectiveness
CABEC	California Association of Building Energy Consultants
CAEATFA	California Alternative Energy and Advanced Transportation Financing Authority
CAGBN	California Green Business Network
CAGI	Compressed Air and Gas Institute
CAHP	California Advanced Home Program
CALBO	California Association of Building Officials
CALGreen	California Green Building Standards Code
CalMTA	California Market Transformation Administrator
CalPRM	California Performance Rating Method
CARB	California Air Resources Board
CASE	Codes & Standards Enhancement Study
CATALENA	California Analysis Tool for Locational Energy Assessment
CBECC	California Building Energy Code Compliance
CBIA	California Building Industry Association
CBO	Community-Based Organization
CBSC	California Building Standards Commission
CCA	Community Choice Aggregator
CCASHP	Cold Climate Air Source Heat Pump
CCC	(1) California Community Colleges [System]; (2) Customer Contact Center
CCD	Community College District
CCEC	California Climate and Energy Collaborative
CDCR	California Department of Corrections & Rehabilitation
CEA	Certified Energy Analyst
CEC	California Energy Commission
CED	Customer Engagement Division (formerly Business Customer Division)
CEDARS	California Energy Data and Reporting System
CEDMC	California Efficiency and Demand Management Council
CEEP	Commercial Energy Efficiency Program
CEESP	California Energy Efficiency Strategic Plan [<i>preferred acronym</i>]
CEQA	California Environmental Quality Act
CEU	Continuing Education Unit
CHEEF	California Hub for Energy Efficiency Financing
CHPWHS	Central Heat Pump Water Heater System
CI	Compliance Improvement [Subprogram]
CLTC	California Lighting Technology Center

Acronym or Abbreviation	Explanation
CMHP	Comprehensive Manufactured Homes Program
CO	Carbon monoxide
CO₂	Carbon dioxide
CO₂e	Carbon dioxide equivalent
COVID-19	Coronavirus Disease 2019
CPUC	California Public Utilities Commission
CRA	(1) California Retailers Association; (2) California Restaurant Association
CRF	California Restaurant Foundation
CSE	Center for Sustainable Energy
CSU	California State University [System]
CTA	Consumer Technology Association
CVAG	Coachella Valley Association of Governments
CWR	[WE&T] Career Workforce Readiness [Program]
D.	Decision
D&S	Demonstration and Showcase
DAC	Disadvantaged Community (ies)
DEER	Database for Energy Efficient Resources
DACMO	Disadvantaged Community Marketing Outreach
DER	Distributed Energy Resources
DG	Distributed Generation
DGS	[California] Department of General Services
DI	Direct Install [Program]
DOE	U.S. Department of Energy
DR	Demand Response
DRPEP	Distributed Energy Resources Partnership Pilot
DS	See D&S , above
DSM	Demand-Side Management
DW	Disadvantaged Worker
ECA	Energy Code Ace
ECM	Electronically Commutated Motors
ED	[CPUC] Energy Division
EE	Energy Efficiency
EEAT	Energy Efficiency Online Audit Tool (aka Enhanced Energy Audit Tool)
EEBD	Energy Efficiency and Building Decarbonization
EEC	Energy Education Center
e.g.	<i>Exempli gratia</i> : for example; such as
EM&T	Emerging Markets & Technologies

Acronym or Abbreviation	Explanation
EM&V	Evaluation, Measurement & Verification
EMIS	Energy Management Information System
EMT	Energy Management Technologies
EPA	Environmental Protection Agency
EPCA	Energy Policy and Conservation Act
EPIC	Electric Program Investment Charge
EPRI	Electric Power Research Institute
ESA	Energy Savings Assistance [Program]
ESG	Environmental, Social and Governance
ESPM	ENERGY STAR [™] Portfolio Manager
ETCC	Emerging Technologies Coordinating Council
ETP	Emerging Technologies Program
eTRM	Electronic Technical Reference Manual
EUL	Effective (or Estimated or Expected) Useful Life
EV	Electric Vehicle
EVSE	Electric Vehicle Supply Equipment
FASP	Facility Assessment Service Program
FTC	Foodservice Technology Center
GES	Global Energy Services
GHG	Greenhouse Gas
GIS	Geographic Information System
GPF	Gallons Per Flush
GW, GWh	Gigawatts, Gigawatt-hours
GWP	Global Warming Potential
HAN	Home Area Network
HEA	Home Energy Advisor [Program]
HECU	high-efficiency remote condensing unit
HEEP	Higher Education Efficiency Performance [Program]
HEEU	high-efficiency remote evaporator unit
HER	Home Energy Report
HFC	hydrofluorocarbon
HP	high performance / heat pump
HPWH	Heat Pump Water Heater
HTR	Hard-to-Reach
HVAC	Heating, Ventilation and Air Conditioning
HVAC&R	Heating, Ventilation, Air Conditioning, and Refrigeration
HVACRedu	HVACRedu.net

Acronym or Abbreviation	Explanation
ICC	International Code Council
IDD	Initial Delivery Date
IDSM	integrated demand-side management
i.e.	<i>Id est</i> : that is; that is to say; namely; in other words
IEA	International Energy Agency
IEEP	Industrial Energy Efficiency Program
IET	Integrated Energy Education and Training (see WE&T , below)
IES	Illuminating Engineering Society
IGPP	Institutional and Government Energy Efficiency Partnership Program
IHACI	Institute of Heating and Air Conditioning Industries
ILP	Induction (Range) Lending Program
IOU	Investor-Owned Utility
IPMT	Intelligent Power Management Technology
I-REN	Inland Regional Energy Network
ISP	Industry Standard Practice
IT	Information Technology
JCM	Joint Cooperation Memorandum
K-12	Kindergarten through 12th grade schools
kW, kWh	kilowatts, kilowatt-hours
LADWP	Los Angeles Department of Water & Power
LCA	Life-Cycle Analysis
LED	Light-Emitting Diode
LEED	Leadership in Energy and Environmental Design
LGP	Local Government Partnership
M&V	Measurement and Verification
MAEDBS	Modernized Appliance Efficiency Database
MAP	Market Access Program
MDMS	Meter Data Management System
MEU	Mobile Education Unit
MFEPP	Multifamily Energy Efficiency Program
MFR	Multifamily Residential
MICE	Midsize Industrial Customer Energy Efficiency [Program]
MIDAS	Market Informed Demand Automation Server
MMH	Mobile and Manufactured Housing
MTAB	Market Transformation Advisory Board
MTI	Market Transformation Initiative
MW, MWh	Megawatts, Megawatt-hours

Acronym or Abbreviation	Explanation
NAICS	North American Industry Classification System
NAR	National Association of Realtors
NASRC	North American Sustainable Refrigeration Council
NATE	North American Technician Excellence
NBI	New Buildings Institute
NCI	National Comfort Institute
NEEA	Northwest Energy Efficiency Alliance
NEEP	Northeast Energy Efficiency Partnership
Net RBn	Total Resource Net Benefit (or TRC Net Benefit)
NIST	National Institute of Standards and Technology
NMEC	Net (or Normalized) Metered Energy Consumption
NREL	National Renewable Energy Laboratory
NTG	Net-to-Gross
OBF	On-Bill Financing
OBR	On-Bill Repayment
OP	Ordering Paragraph
P4P	Pay for Performance
P&C	Planning & Coordination [Subprogram]
PA	Program Administrator
PAR	Parabolic Aluminized Reflector
PEP	Public Energy Performance [Program]
PG&E	Pacific Gas & Electric Company
PHCA	Passive House California
PNNL	Pacific Northwest National Laboratory
PPPC	Public Purpose Programs Charge
PRG	Procurement Review Group
PRM	Performance Rating Method
PSPBR	Public Sector Performance-Based Retrofit
PUC	See CPUC , above
PV	PhotoVoltaic
QA	Quality Assurance
QC	Quality Control
QI	Quality Installation
QM	Quality Maintenance
QS	Quality Service
RC	Reach Codes [Subprogram]
RCI	Residential, Commercial, and Industrial

Acronym or Abbreviation	Explanation
RCT	Randomized Control Trial
RCx	Retrocommissioning
REEL	Residential Energy Efficiency Loan [Program]
REN	Regional Energy Network
Res DI	Residential Direct Install
RFA	Request for Abstract
RFP	Request for Proposal
RIM	Ratepayer Impact Measure
RNC	Residential New Construction
S&S	Scanning and Screening
SB	(1) Senate Bill; (2) Small Business
SBCCOG	South Bay Cities Council of Governments
SBD	Savings By Design [Program]
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison Company
SCG	Southern California Gas Company (aka SoCalGas or The Gas Company)
SCPD	Stanford Center for Professional Development
SDG&E	San Diego Gas & Electric Company
SEI	Strategic Energy Innovations
SEM	Strategic Energy Management [Program]
SEP	Smart Energy Program
SFP	Scaled Field Placement
SFR	Single-Family Residential
SMB	Small and Medium (-sized) Business
SMUD	Sacramento Municipal Utility District
SoCalGas	Southern California Gas Company (aka SCG or The Gas Company)
SoCalREN	Southern California Regional Energy Network
SOC ESS	State of California Energy Strategy and Support [Program]
SRP	Summer Reliability Program
SSPC	Standing Standard Project Committee
Strategic Plan	See CEESP , above
SW or S/W	Statewide
SWEETP	Statewide Electric Emerging Technologies Program
SWL	Statewide Lighting [Program]
T&D	Transmission and Distribution
TA	(1) Technology Assessment [Subprogram]; (2) Trade Allies
TAG	Technical Advisory Group

Acronym or Abbreviation	Explanation
TDR	Technology Development Research
TDS	Technology Development Support
TDV	Time Dependent Valuation
TE	Transportation Electrification
TEC	The Energy Coalition
TFP	Technology Focused Pilot
TIS	Technology Introduction Support
TLL	Tool Lending Library
TPI	Third-Party Implementer (or Third Party-Implemented)
TPM	Technology Priority Map
TRC	(1) Total Resource Cost; (2) TRC Solutions, a third-party implementer <i>Note: see also Net Rbn, above.</i>
TSB	Total Savings Benefit
TSR	Technology Support Research
TUAL	True-Up Advice Letter
UAT	Universal Audit Tool
UC	University of California
USC	University of Southern California
USGBC	U.S. Green Building Council
VCHP	Variable Capacity Heat Pump
VCREA	Ventura County Regional Energy Alliance
VFD	Variable-Frequency Drive
VR	Virtual Reality
VRF	Variable Refrigerant Flow
WCEC	Western Cooling Efficiency Center
WE&T	Workforce Education & Training
WE&T IEET	WE&T Integrated Energy Education and Training [Subprogram]
WISE	Water Infrastructure & System Efficiency [Program]
WRCOG	Western Riverside Council of Governments
ZNE	Zero Net Energy



Attachment B

**Notice of Availability of Southern California Edison Company's Amended
Posting of 2023 Energy Efficiency Programs Annual Report and Supporting
Documents**

**BEFORE THE PUBLIC UTILITIES COMMISSION OF THE
STATE OF CALIFORNIA**

Order Instituting Rulemaking Concerning Energy
Efficiency Rolling Portfolios, Policies, Programs,
Evaluation, and Related Issues.

Rulemaking 13-11-005

**NOTICE OF AVAILABILITY OF SOUTHERN CALIFORNIA EDISON COMPANY'S
(U 338-E) AMENDED POSTING OF 2023 ENERGY EFFICIENCY PROGRAMS
ANNUAL REPORT AND SUPPORTING DOCUMENTS**

Pursuant to the Administrative Law Judge's Ruling Adopting Annual Reporting Requirements for Energy Efficiency and Addressing Related Reporting Issues dated August 8, 2007, Southern California Edison Company (SCE) hereby provides notice to the service list in proceeding R.13-11-005 that the following documents are available for viewing and downloading on Proposal Evaluation & Proposal Management Application (PEPMA) website within 10 days:

SCE's Amended 2023 Energy Efficiency Annual Report (Annual Report) and supporting documents, including the following appendices, as shown in the table of contents:

- Appendix A – Annual Report Tables
- Appendix B – Southern California Edison Programs for 2023
- Appendix C – Statewide and Third Party-Implemented Programs
- Appendix D – Regional Energy Networks Joint Cooperation Memoranda
- Appendix E – List of Acronyms and Abbreviations

Additionally, SCE provides notice to the above-referenced service list that the Annual Report, in Section 9, highlights the key activities of the statewide Workforce, Education and Training (WE&T) Program for 2023 in compliance with D.09-09-047.

**BEFORE THE PUBLIC UTILITIES COMMISSION OF THE
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Rulemaking 13-11-005

Respectfully submitted,

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