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 (Filed November 14, 2013)

2016 ENERGY EFFICIENCY ANNUAL REPORT OF PACIFIC GAS AND ELECTRIC COMPANY (U 39 M)

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Dated: May 1, 2017

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Pacific Gas and Electric Company (PG&E) submits the attached 2016 Energy Efficiency Annual Report (2016 Report) in accordance with the August 8, 2007 *Administrative Law Judge's Ruling Adopting Annual Reporting Requirements For Energy Efficiency and Addressing Related Reporting Issues* (Ruling), in Rulemaking (R.) 06-04-010 and direction from the California Public Utilities Commission (CPUC) Energy Division. Ordering Paragraph 2 of the Ruling requires "each utility to file its annual report on May 1 of the year following the end of a given program year." The EE Report is being filed and served on parties in this docket because R.13-11-005 is the successor proceeding to R.09-11-014, which succeeded R.06-04-010.

PG&E has prepared the 2016 Report in accordance with the Annual Reporting Requirements Manual, Version 4 (Manual), which is Attachment C to the Ruling. The 2016 Report describes the programs that comprised the 2016 energy efficiency portfolio and summarizes PG&E's energy efficiency accomplishments for 2016. The 2016 Report is posted to the CPUC's Energy Efficiency Statistics website at: http://eestats.cpuc.ca.gov/Views/Documents.aspx.

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To access the 2016 Report, follow these steps;

- In the Report Category, select Annual.
- Under Report Options, select 2016
- In the Report Type, select Narrative and Spreadsheets.
- In Report Options, select PGE for Utility

Respectfully Submitted,

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2016 ENERGY EFFICIENCY ANNUAL REPORT

MAY 1, 2017

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Executive Summary

Serving homes, businesses, agriculture and industry across the state, Pacific Gas and Electric Company (PG&E) expertly delivers energy efficiency (EE) solutions, empowering customers to eliminate unnecessary energy use, reduce their carbon footprint and save money. In 2016, PG&E continued its role as a leader in EE, delivering a dynamic and cost-effective portfolio of programs.

Through more than 10 statewide and 50 local programs, PG&E serves the diverse needs of more than 15 million customers across our 70,000 square mile service territory. 2016 marked the continuation of ambitious energy efficiency partnerships and successful programs

PG&E focused on several key initiatives to drive deep energy savings and position the state to meet its ambitious EE and carbon reduction goals.

PG&E Exceeded 2016 CPUC- Adopted Savings Goals and Delivered a Cost-Effective EE Portfolio

In 2016, PG&E achieved:

- **114%** of its gross electric energy savings goal (1,406 gross annual GWh)
- **129%** of its gross electric demand reduction goal (292 gross summer peak MW)
- **128%** of its gross gas savings goal (23.59 gross annual million therms)

Codes and Standards Advocacy exceeded its 2016 goals:

- **102%** of its net electric goal (620.8 net annual GWh)
- **100%** of its net electric demand reduction goal (141.9 net summer peak MW)
- **116%** of its net therm goal (6.4 million therms)

PG&E's total 2016 EE portfolio was cost-effective, at **1.49 TRC** and **3.39 PAC**

PG&E's EE programs **avoided 1,575,800 tons of carbon dioxide in 2016**, continuing as a strong partner in helping reduce California's greenhouse gas emissions

Helping Customers Respond to California's Drought

2016 marked a continuation of California's persistent drought, with water conservation and the governor's 25% reduction in water usage top of mind for many customers. PG&E responded by offering Simple Savings Kits, which provided low cost ways to save energy and water in the home. PG&E sold approximately 23,000 kits. PG&E also offers water-saving tips and strategies to residential customers on its "My Energy" website.

For Agricultural customers, PG&E provided rebates for sprinkler to drip irrigation, which increases the efficiency of the customer's water application and reduces waste. Additionally, the Advanced Pumping Efficiency Program (APEP), a joint service provided by PG&E and the California State University, Fresno, offered an educational and incentive program to improve overall agricultural pumping efficiency and encourage energy conservation.

Advancing Zero-Net-Energy (ZNE) Building Design and Technology

In March 2016, PG&E completed the Zero Net Energy Home Display and ZNE Modular Classroom at the Energy Training Center in Stockton, which provides for a multi-layered, hands-on, virtual experience to engage the community with clean energy building solutions. An interactive iPad application allows visitors to take an interactive tour of ZNE upgrades within the home, while cutaways offer detailed views of internal features.

PG&E also partnered with six builders, including Habitat for Humanity, to support ZNE demonstration homes across the service territory. PG&E's support ranged from recommending additional energy efficiency measures and conducting air sealing measurements to technical assistance, incentives and performance monitoring for demonstration homes.

Engaging Customers through the Step Up and Power Down Initiative
Step Up and Power Down is a marketing campaign designed to engage owners, operators, and employees to reduce commercial energy waste through community-based social marketing. PG&E partnered with the cities of San Jose (SJ) and San Francisco (SF) to launch the initiative in May 2015, and it recently concluded in December 2016 having met its campaign goals. Across both cities, the targeted downtown areas saved 51.1 GWh and more than 1,275 businesses pledged to Step Up and Power Down. PG&E designed the initiative to raise awareness about EE, increase uptake of PG&E's EE programs, and examine behavioral and operational energy savings impacts. The impact of the initiative is currently the focus of an evaluation measurement and verification (EM&V) study by Research Into Action (RIA). PG&E donated $1 million in shareholder funds to each of the cities for meeting their goals to use for environmental sustainability and energy projects of their choice.

Reducing Load Where It Really Counts
PG&E continued its targeted demand side management (TDSM) initiative in 2016 by targeting six additional substations to achieve an 8.2 MW reduction by the end of 2017. By leveraging existing EE, demand response (DR), and distributed generation (DG) programs, PG&E reached its goals in 3 out of the 6 substations in 2016 and achieved 5.7 MW in savings. PG&E achieved the two-year goals in one year for 3 substations: Sycamore, Notre Dame and Linden substations. In 2017, PG&E will continue to target the Rincon substation, and will reevaluate the Esquon and Belle Haven substation deployment strategy in light of the Integrated Distributed Energy Resources (IDER) incentive pilots and Distribution Resource Plan (DRP) demonstration projects which represent a new opportunity for future substation projects.

Transforming the Plug Load Market through Innovative Industry Partnerships
Working closely with ENERGY STAR® staff and more than ten other utilities and program administrators nationwide, PG&E led a national expansion of the Retail Products Platform (RPP) pilot which launched in March of 2016. This pilot incentivizes retailers to stock, promote and sell more energy efficient appliances and electronics in their stores. The aim of this effort is to positively impact plug load market transformation in our territory as well as in the national marketplace. RPP positions California one step closer to achieving the California Energy Efficiency Strategic Plan goals of reducing plug loads by 25%, and meeting the state's ambitious ZNE goals.

Extending the Reach of Customers' EE Dollars through Financing
PG&E's EE financing programs play a critical role in the overall portfolio by allowing customers to pursue large, comprehensive efficiency retrofit projects that might not have been financially feasible otherwise. In 2016, PG&E funded 398 loans totaling more than $15 million. Across its lifetime, the program has funded more than 1,700 loans worth more than $75 million. The On-Bill Financing (OBF) subprogram continued to experience significant growth in applications and financed projects, with an 8% increase in total loan volume and a 17% increase in small and medium-sized business (SMB) loans.

PG&E's 2016 Annual Report describes the full set of programs delivering cost-effective energy savings for our customers. PG&E will continue to deliver on its commitment to customers and

its commitment to California to deliver cost-effective EE and carbon reduction goals through innovative program and pilot strategies, and excellence in program administration.

Annual Report Data

D. 15-10-028 established annual energy savings and demand reduction targets for the 2016 investor-owned utilities (IOU) resource programs on a gross basis and Codes and Standards Advocacy on a net basis. In 2016, PG&E achieved 1,406 gross annual GWh which is 114% of its electric energy savings goal; 292 gross summer peak MW which is 129% of its electric demand reduction goal; and 23.59 gross annual million therms which is 128% of its gas savings goal for the IOU[1] programs. In addition to helping customers save energy and money, PG&E's portfolio of EE programs continued to significantly contribute to the state's goal of reducing greenhouse gas emissions, with avoided annual emissions of 1,575,800 tons of carbon dioxide. PG&E's total portfolio was cost-effective, with a 1.49 TRC and 3.39 PAC, including Codes and Standards advocacy. Please see Section 4 for more specifics on PG&E's portfolio cost-effectiveness.

Codes and Standards Advocacy achieved 102% of its net electric goal, (620.8 net annual gWh), 100% of its net electric demand reduction goal (141.9 net summer peak MW), and 136% of its net therm goal (6.4 million therms).

Total 2016 portfolio gross energy savings shown in this report include: 1) savings associated with PG&E's deemed savings program, which include Database for Energy Efficient Resources (DEER) and final approved work paper values from the 2016 customer energy savings projects; 2) savings associated with custom projects that were installed in 2016; 3) savings associated with behavioral programs that occurred in 2016; 4) savings for Bay Area Regional Energy Network (BayREN) and Marin Clean Energy (MCE) as reported in their 2016 Annual Reports, and 6) Energy Savings Assistance Program (ESAP) savings.

D.09-09-047 defined and D. 12-11-015 clarified the 10 percent on utility administrative cost cap, 6 percent marketing cost cap, 4 percent EM&V cost cap and direct implementation non-incentive (DINI) target of 20 percent. The 2016 EM&V budget is four percent of the program portfolio, including BayREN, MCE and statewide Marketing, Education and Outreach (ME&O). Statewide ME&O is excluded from the marketing cap.[2] PG&E reports its progress against these caps and targets in quarterly reports posted on the CPUC's Energy Efficiency Statistics (EE Stats) website (http://eestats.cpuc.ca.gov/) along with quarterly fund shifting reports. PG&E's monthly expenditure and savings reports are also posted on EE Stats.

1 This 2016 EE Annual Report refers to PG&E, Southern California Edison (SCE), San Diego Gas and Electric Company (SDG&E), and Southern California Gas Company (SoCalGas), collectively as "the IOUs" or "the utilities."

2 D.13-12-038, pg. 82.

Program Descriptions and Strategies – Statewide Programs

In 2016, the IOUs administered 10 statewide programs that covered every market sector and customer type, across all technology families, and used a variety of market intervention strategies from upstream rebates targeted at manufacturers and distributors to buy-down the cost of the product for the end-use customer to midstream and downstream incentives. These programs support California's Long-Term Energy Efficiency Strategic Plan goal to provide a more integrated EE experience for customers and to provide customers with access to information and greater financing opportunities.

This section describes the successful strategies and accomplishments employed by PG&E in 2016 for the following statewide programs:

1. Residential
2. Commercial
3. Industrial
4. Agricultural
5. Lighting
6. Codes and Standards
7. Emerging Technologies
8. Workforce Education and Training
9. Integrated Demand-Side Management
10. Financing

Residential Program

PG&E's Residential EE programs offer a robust suite of incentives, services, and tools aimed at helping customers eliminate unnecessary energy use, save money, and enhance home comfort. The programs engage customers and other market actors through a variety of channels including:

- Built environments such as whole home upgrades, Heating, Ventilation and Air Conditioning (HVAC), and new construction
- Engaging retail and manufacturers on more efficient plug loads and appliances
- Behavioral and home energy management tools and initiatives

PG&E's Key Residential Program Goals

- Inspire and empower our customers to eliminate unnecessary energy use
- Serve as a "trusted energy advisor" to support customers' energy management journey
- Reduce barriers to participate in EE programs and enhance benefits of participation
- Provide comprehensive, bundled solutions for customers
- Provide customers with enhanced on-line options and processes
- Foster strong relationships with retailers, distributors and manufacturers
- Develop close partnerships with cities, contractors and local community organizations
- Support market transformation efforts and Strategic Plan goals
- Support transmission and distribution (T&D) deferral efforts

Key Initiatives

PG&E's Residential Program priorities described below are based on supporting overall program objectives and energy savings goals.

Energy Upgrade California™

Existing residential buildings account for 31 percent of California's electric usage.[3] Energy Upgrade California™ aims to capture this large savings potential and help customers achieve deep energy reductions through three approaches: Energy Upgrade California™ - Home Upgrade (Home Upgrade) and Energy Upgrade California™ - Advanced Home Upgrade (Advanced Home Upgrade), and Energy Upgrade California™ – Multifamily Home Upgrade (Multifamily Home Upgrade).

Energy Upgrade California™ seeks to transform the residential EE market through a one-stop approach so that whole home upgrades are valued and standard practice for homeowners. This approach views the building as a set of interdependent systems that must be considered holistically.

Plug Load and Appliances

3 California Energy Efficiency Strategic Plan, January 2011 update, Section 2, p. 9: http://www.cpuc.ca.gov/NR/rdonlyres/A54B59C2-D571-440D-9477-3363726F573A/0/CAEnergyEfficiencyStrategicPlan_Jan2011.pdf.

Plug Load and Appliances addresses the largest area of growth in energy consumption in the average residential household through tactical marketing initiatives, retailer engagement, and new product deployment. The program provides solutions to address increasing energy usage from products not covered by state or federal efficiency standards. The program is continuing to offer rebates and incentives to customers for purchasing and installing high efficiency appliances (such as ENERGY STAR® rated water heaters and pool pumps) and working with partners to drive adoption of higher efficiency products and water saving measures.

Retail Products Platform

Working closely with ENERGY STAR® staff and more than fifteen other utilities and program administrators nationwide, PG&E's Residential program team led a national expansion of the RPP pilot in 2016. RPP aims to enable program administrators to capture a large number of small energy savings by motivating retailers to promote, assort, stock, and demand more energy efficient models.

RPP is a strategic market transformation effort designed to create long-lasting, sustainable changes in the functioning of product-specific markets by reducing market barriers to the adoption of energy efficiency plug-load and appliances. RPP is aimed at addressing the growing number of small plug-loads on the market through a mid-stream incentive to retailers, increasing the number of energy efficient appliance models on participating store shelves in targeted categories.

Energy Advisor

Energy Advisor is a suite of products and data-driven interactive tools designed to engage and educate customers to reduce their energy consumption. By combining detailed analysis of energy usage, billing and costs based on actual household consumption with social science, Energy Advisor delivers personalized energy saving strategies, prioritized recommendations and suggestions for energy conservation.

Comprehensive Multifamily Support

Comprehensive multifamily support implements new and innovative ways to support this traditionally underserved market segment and provide leadership in innovative multifamily program offerings. PG&E is focusing on identifying new approaches to enhance the participation of the multifamily segment's engagement and participation with EE. The new Multifamily Upgrade Program aims to provide incentives and messaging that better align with the decision making of property managers and tenants.

Step Up and Power Down

PG&E's Step Up and Power Down Residential (SUPD-R) initiative is designed to drive increased awareness of PG&E's residential energy efficiency measures, change attitudes toward energy efficiency, and increase customer engagement and uptake in PG&E's programs. SUPD-R implementation is based on behavioral science principles, especially community-based social marketing and behavioral economics.

SUPD-R outreach activities include grassroots organizing, volunteerism, and leveraging local community partnerships to share experiences, resources, and support for choosing energy efficient actions in the home. SUPD-R outreach activities were held throughout 2016 in Woodland, San Carlos, and Redwood City, with a heightened focus on Earth Day events.

Residential Subprograms

Residential Energy Advisor Subprogram

The Residential Energy Advisor subprogram uses behavioral outreach initiatives and interactive tools, including the Home Energy Report (HER) and Home Energy Checkup (HEC), to engage customers and encourage participation in innovative energy initiatives. The suite of products and services enable customers to understand and manage their energy use, and where appropriate, be guided to whole-house energy solutions. The HER is sent to over 1.5 million customers on an ongoing basis to show how their energy usage changes over time and how their usage compares with similar homes in their area. The HEC is a self-guided online assessment that helps customers understand where they use energy in their homes, provides energy-saving tips and suggestions based on their specific situations, and generates a simple checklist plan saved on their PG&E My Account website to track their progress as they complete the items on their plan.

2016 Strategies and Successes

In 2016, PG&E continued to fine tune an integrated customer journey that starts with a HER, motivating the customer to perform an online HEC, and finally to take advantage of PG&E's rebates and incentives to make EE and whole home upgrades affordable.

PG&E focused on the enhancement and expansion of the HER product, a personalized mailer aimed to create positive energy change to a broad consumer base by showing the consumer their home's energy use and how they compare to similar homes in their area. Based on learnings from the first waves of reports, PG&E launched additional waves to reach over 300,000 new customers. Currently, 1.5 million active customers are enrolled in HER. PG&E also expanded email HERs to over 250,000 existing HER recipients to complement the mailer and drive deeper engagement in the online channel.

PG&E also focused on boosting marketing efforts to attract more customers to complete the online self-audit. This resulted in over 90,000 new customers who completed the HEC, well exceeding PG&E's anticipated response of 50,000 online audits.

PG&E also enhanced the HEC product with a completely new visual refresh to the online survey. The new survey was redesigned to increase engagement, completion rates and to provide more relevant tips to customers.

Plug Load and Appliances Subprogram

The Plug Load and Appliances subprogram offers rebates and incentives to customers for purchasing and installing high efficiency appliances and pool pumps, and working with other partners to drive the adoption of higher efficiency products as well as water saving measures. PG&E also worked with ENERGY STAR® staff and other utilities to lead a national expansion of RPP aimed at establishing a cost-effective methodology that provides customers with midstream incentives through retailers in order to capture the large volumes of small energy savings from many plug- load devices.

Additionally, the statewide IOU program team completed the Phase 2 Residential Solutions Workbook project, an EM&V effort to help design and manage residential efficiency programs by aggregating and displaying market and energy use data through a single tool and built specific dashboards for different technologies (i.e., pool pumps, water heaters, and other technologies).

2016 Strategies and Successes
PG&E offered programs to residential end-use customers to cover some of the incremental costs of purchasing energy-efficient products. Eligible products included clothes washers, gas water heaters, electric heat pump water heaters, variable speed pool pumps and motors, and a limited-time offer of a water-energy savings kit.[4]

Marketing of the rebate programs was conducted on a multi-touch, multi-channel level including tactics such as email, digital advertising, and within PG&E owned assets such as the website, residential digital newsletter and HERs. PG&E also successfully launched the RPP Pilot in March 2016.

The program was supported by a field services team who provided salesperson training, point of purchase (POP) materials, and in-field support to retail partners. In 2016, PG&E had over 77,500 applications for the program, which were received via mail, online, and at retail point-of-sale. This was mostly attributed to ongoing work with water agencies on joint water/energy savings measures, use of POP material, and online messaging about rebate availability in stores and on retailers' websites.

Multifamily Energy Efficiency Rebates Subprogram

The Multifamily Energy Efficiency Rebates (MFEER) subprogram offered a variety of incentives for energy-efficient products and services to motivate multifamily property owners and managers to install the products. These products can be used to save energy in both the common and dwelling areas of multifamily complexes and common areas of mobile home parks and condominiums. An additional objective of the program is to heighten awareness of EE among property owners, property managers, and tenants. The program also collaborated with BayREN and MCE for multifamily event coordination and via a common initial customer interest form to determine the best solutions to offer.

The MFEER program experienced a low volume of applications in 2016. PG&E is working with the vendor to redesign the program to put more emphasis and resources toward holistic collaborations between programs to an entire property in 2017.

2016 Strategies and Successes
In an effort to maximize the savings potential and benefits for customers, MFEER coordinated with the Energy Savings Assistance (ESA) and Multifamily Upgrade programs, among others. This integrated approach combined market-rate and income-qualified EE measures.

PG&E and the other IOUs continued to advertise in various apartment industry trade publications and participated in several trade shows promoting MFEER and other related programs. As a result, the program maintained continued engagement with energy specialists and property management firms, and offered a solution for customers not interested in a comprehensive retrofit program.

4 Water energy savings kit included items such as LED lighting and low flow showerheads. For more information, see the Water-Energy Nexus section (pp. 60-62).

Energy Upgrade California™ Subprogram

The Energy Upgrade California™ program provides incentives for comprehensive home upgrades to residential customers in single family (Home Upgrade and Advanced Home Upgrade) and multifamily (Multifamily Home Upgrade) homes. The program guides and supports customers to complete comprehensive energy saving retrofits using the whole house approach. PG&E is particularly focused on safety and customer satisfaction, as each potential participant receives industry leading combustion appliance safety testing. PG&E also ensures carbon monoxide monitors are installed to promote continued safety.

2016 Strategies and Successes

PG&E's Home Upgrade program completed 11,345 jobs in 2016, representing a 311% increase over the 3,645 jobs completed in 2016. On average, homeowners that participated in Advanced Home Upgrade are expected to see a 23 percent improvement in their household energy use.

PG&E is also leading work to expand allowable software options for the program (CalTEST), which is anticipated to increase the accuracy of savings predictions, improve program sales and market investments, and enhance the customer experience.

PG&E's Home Upgrade program has garnered much success throughout 2016, achieving a high satisfaction rate among participants.

PG&E has continued to streamline program operations. Building on 2013 improvements, the IOUs have continued to work closely with program participants to identify and resolve application and process challenges through improved desktop review practices and inspection processes and additional training to contractors.

PG&E also continues to innovate building a more robust contractor channel via collaborative approaches such as integration of Air Conditioning (AC) Quality Care and Home Upgrade and concierge mentoring. In late 2016, PG&E opened the Advanced Home Upgrade pathway to C Licensed contractors in support of more comprehensive retrofits.

Multifamily Home Upgrade Subprogram

PG&E's Multifamily Upgrade program (MUP) promotes long term energy benefits for affordable and market rate multifamily housing through comprehensive energy efficiency upgrades. Historically, owners and managers of multifamily properties have been less responsive to energy efficiency efforts than other residential customers. The MUP uses a tiered performance-based approach which allows property owners to make informed decisions on cost effective measures and maximize savings by conducting an energy audit, and offers incentives to offset the cost of the assessment and the improvements.

PG&E's Multifamily Home Upgrade program completed 3,301 units in 2016, more than doubling the 1,469 units completed in 2015. The program achieved an average 19% improvement in building energy efficiency compared to existing conditions.

2016 Strategies and Successes

PG&E continues to strengthen MUP through focused training with approved Raters and Contractors; streamlining project assessment reviews, and an emphasis on field quality control to engage with partners throughout the process and showing owners that MUP verifies the quality and completeness of the work. Quarterly partner calls were instituted to provide a communication channel to update partners about program developments, rule changes, and

provide continuous feedback to ensure the information they share with customers is the most current.

In 2016, the program added clothes washers and demand control pump controls for central water heating systems to the program's list of eligible measures. The program will continue to ensure that all savings opportunities, including those outside of approved modeling software, are identified. This has assisted in contributing to the average 19% improvement in building energy efficiency achieved in 2016.

MUP also serves as a key contact and coordinator with other programs (e.g., BayRen, other utility and PG&E programs) to provide assistance and referral to customers where the scope of work was more relevant for other programs. This helps to ensure that customers are provided with the resources they need to participate in energy efficiency programs and services.

Residential New Construction Subprogram

Residential New Construction consists of the California Advanced Homes Program (CAHP) for single family homes, and PG&E's California Multifamily New Homes (CMFNH) third party program. The CAHP and CMFNH highlight best practices in energy efficiency, green building, and sustainability, and offers financial incentives to help builders and architects create environmentally friendly, energy-efficient communities for potential home buyers. CAHP works to encourage building and related industries to exceed California's Title 24 EE standards through a combination of education, design assistance, and financial support, and to prepare builders to achieve ZNE by 2020.

2016 Strategies and Successes

The Residential New Construction program continued its program structure and design using an energy use index called the CAHP Score in lieu of percent above code. This has been easily understood and adopted by builders and their consultants. Furthermore, a strategy to leverage the relationship between Title 24 consulting firms and their builder clients proved successful. CAHP ensured Title 24 consultants possessed the requisite tools and knowledge to directly explain program benefits to builders and thereby recruit projects on the program's behalf. Directly engaging professional consulting firms was also beneficial in streamlining process efforts.

Overall, CAHP continued to move the market towards efficient home construction and the capacity to achieve future Title 24 updates, while also beginning to prove the potential for ZNE new construction two code cycles prior to the state's goal.

Residential HVAC Subprogram

Residential HVAC is focused on driving EE and peak load reduction from our customers' use of heating and air conditioning. The program promotes increased quality levels in the HVAC market for technology, equipment, installation, and maintenance. In addition to working with HVAC contractors on improving HVAC maintenance and installation practices through the AC Quality Care offering, the subprogram recently launched small scale pilots of both a HVAC distributor incentive program to sell more high-efficiency units and an incentive program to improve HVAC code and permit compliance.

Strategies and Successes

Residential HVAC Quality Maintenance efforts are increasingly popular among contractors and home owners, resulting in the treatment of over 20,000 HVAC systems—more than triple the 2016 goal (4,750 HVAC systems). The high quality technical training offered by PG&E enabled

contractors and their staff to learn HVAC maintenance best practices, as seen by an uptick in contractor participation from 94 in 2015 to 108 in 2016. PG&E also implemented multiple program enhancements contributing to higher participation rates, improved cost effectiveness, and greater customer satisfaction. This includes removing the airflow correction measure, adjusting incentive levels, removing kickers, and ensuring the program could serve a greater number of customers.

The participation level in HVAC “upstream” distributor incentive and Code Compliance pilot was significantly improved by direct outreach to HVAC distributors. PG&E conducted customer outreach activity via e-mail for the Code Compliance pilot, contributing to increased awareness on code compliance and higher customer participation. HVAC contractor awareness of these efforts was also improved by outreach via direct mail during the summer months.

Commercial Program

The Commercial Program allows customers to install equipment and systems that are more efficient than they would install without the program. In addition, customer confidence in the persistence of their savings is increased by the program's commitment to installing high-quality, reliable, cost-effective measures.

The statewide Commercial EE program offers commercial customers a consistent suite of products and services to help overcome the market barriers to optimized energy management. The program targets integrated energy management solutions− including EE, DR, and DG− through strategic energy planning support; technical support services, such as facility audits and calculation/design assistance; and financial support through rebates, incentives, and financing options.

PG&E's Commercial EE program also targets customer segments, including offices, retail facilities, restaurants, grocery stores, schools (both K−12 and higher education), lodging facilities, municipalities, health facilities, distribution warehouses, and small business customers. PG&E also offers local program elements such as third party and government partnership programs that complement and enhance these core offerings.

In 2016, PG&E collaborated with stakeholders to create energy efficiency business plans, which were submitted in early 2017. PG&E's vision for energy efficiency in the commercial sector centers on empowering large and SMB customers to better understand, manage, and eliminate unnecessary energy use. PG&E is excited to have the opportunity to redefine the commercial portfolio of programs to achieve California's future climate goals.

Key Initiatives

Commercial Whole Building Demonstration

PG&E developed and launched the Commercial Whole Building (CWB) Demonstration in 2013 as a proof of concept pay-for-performance initiative targeting deep energy savings in existing commercial buildings. 2016 was CWB's third year in this stage and PG&E continues to refine the offering. In addition to targeting deep energy savings, CWB uses data science and actual energy and weather data to validate customer savings. This has been made possible by PG&E's broad deployment of smart meter technology. By using robust data analytics, CWB is helping shape how to claim savings via normalized metered energy consumption (NMEC).

Since not all buildings or efficiency projects are suitable for this approach, recruitment for the CBW Demonstration was conducted on an invitation-only basis and directed toward high-potential buildings and projects designed to achieve at least 15 percent energy savings. PG&E enrolled 12 projects in the CWB Demonstration in 2016 – including office, grocery, and municipal facilities – which installed a variety of retrofit and retro-commissioning efficiency measures. Project implementation has been completed at all 12 project sites, and the measurement of energy savings will continue through quarter (Q) 3 of 2017, with final results expected in 2018.

Targeted Demand Side Management (TDSM) Initiative
PG&E continued its TDSM initiative in 2016 by targeting six additional substations to achieve an 8.2 MW reduction by the end of 2017. By leveraging existing EE, DR, and DG programs, PG&E reached its goals in 3 out of the 6 substations in 2016 and achieved 5.7 MW in savings. PG&E achieved the two-year goals in one year for 3 substations: Sycamore, Notre Dame and Linden substations. PG&E will continue to target the Rincon substation in 2017 and will reevaluate the Esquon and Belle Haven substation deployment strategy in light of IDER incentive pilots and DRP demonstration projects which represent a new opportunity for future substation projects.

Step Up and Power Down
Step Up and Power Down is a marketing campaign designed to engage owners, operators, and employees to reduce commercial energy waste through community-based social marketing (CBSM). PG&E partnered with the cities of San Jose (SJ) and San Francisco (SF) to launch the initiative in May 2015, and it recently concluded in December 2016 having met its campaign goals (SF: 600 participants, 20 GWh saved; SJ: 400 participants, 25 GWh saved).

PG&E designed the initiative to raise awareness about EE, increase uptake of PG&E's energy efficiency programs, and examine behavioral and operational energy savings impacts. The impact of the initiative is currently the focus of an EM&V study by Research Into Action (RIA). PG&E donated $1 million in shareholder funds to each of the cities for meeting their goals to use for environmental sustainability and energy projects of their choice.

PG&E marketed the initiative through partnerships with community based organizations using outdoor transit advertisements, streetlamp signs, website advertising, and face-to-face engagement. Many ads were personalized, featuring individual energy champions from the community. The campaign tailored its engagement approach to meet the needs of a wide array of business types and sizes. Large businesses received customized behavioral audits alongside technical training to achieve savings through both upgrade projects as well as employee engagement campaigns. Smaller establishments committed to simple but impactful actions appropriate for their businesses.

2016 Strategies and Successes

PG&E focused on several key strategies in 2016 to position its programs to achieve the Strategic Plan's vision for the Commercial sector: putting commercial buildings on a path to ZNE by 2030 for all new buildings and half of existing buildings.[5]

Specifically, PG&E leveraged its breadth of offerings to meet the needs of its diverse commercial customer base. PG&E strived to meet customers in their energy journey through its statewide programs dedicated to new construction, retrofit/retrocommissioing and behavioral services. PG&E also launched a deemed new construction offering in 2016 to provide smaller commercial new construction projects an express alternative to the Calculated and Savings By Design (SBD) programs . The soft launch of the deemed new construction program resulted in 37 total applications and 118,849 kWh in energy savings. Third party programs dedicated to targeted, niche segments also complemented statewide offerings.

5 California Long Term Energy Efficiency Strategic Plan, 2011 Update: http://www.energy.ca.gov/ab758/documents/CAEnergyEfficiencyStrategicPlan_Jan2011.pdf

Deep engagement with contractors, trade professionals, building engineers, design teams, energy service companies (ESCOs), manufacturers, retailers, and distributors allowed PG&E to deliver a wide variety of intervention strategies to provide customers with better access to information about their energy use. This approach also helped identify and prioritize ways to reduce energy use and increase EE, and provided tools and opportunities to increase the affordability of EE projects in both new and existing facilities.

PG&E also focused on documentation and communication of custom program policies in 2016. To raise stakeholder awareness, PG&E authored the Custom Rulebook, distilling over 1,600 pages of dispositions and decisions into a 40 page compendium of guidance describing the calculation, eligibility, and regulatory policies applicable to custom projects. Numerous stakeholders, from implementers to Commission ex ante review staff and consultants, provided input that shaped the Rulebook's initial release. Following the Rulebook's release, PG&E delivered more than 30 presentations to over 200 custom stakeholders on its content. Three updates have already been made to the Custom Rulebook to add clarity, with more expected for 2017.

Opportunities Moving Forward

PG&E will employ several new strategies over the next year to advance the state's ambitious policy goals and place PG&E's customers on the path to deep and persistent energy savings. This includes an emphasis on data analytics for enhanced customer targeting, technical assistance and tools, new financial solutions, and developing new program models for metered-based savings.

PG&E is working collaboratively with the statewide SBD team and Commission staff to better align the program on the path to ZNE. Additional program enhancements include technical assistance offerings to ensure savings persistence in commercial new construction buildings. PG&E is also working to provide a more integrated offering with our workforce education and training (WE&T) teams to train and transform the ZNE market.

PG&E spent 2016 planning the re-envisioned Commercial HVAC Optimization. The new program offering facilitates multiple paths for customer participation and launched in 2017. The program design includes tiers, a one-year and three-year maintenance agreement for participation based on customers' needs, and will align more closely with the statewide program design.

In addition, PG&E spent 2016 planning with the IOU statewide team to update the retrocommissioning (RCx) offering for 2017 to better serve smaller facilities and incorporate lessons learned from ex post evaluations and ex ante review processes.

***Serving Our Customers*:**
Through its Third Party Program channel, PG&E offers commercial customers a suite of targeted, niche program offerings designed specifically to meet them on their energy journey.

In 2016, Third Party programs targeted retail, small and medium businesses, large offices, hospitals, data centers, grocery stores, and focused on a variety of technologies including HVAC, advanced LEDs, and boilers. Additional details may be found in the Third Party programs section of this report.

Statewide program design and implementation offers many benefits, including making it more efficient, comprehensible, cost effective, and attractive for multi-site customers, third parties, contractors, distributors, retailers, lenders, state and federal agencies, and other stakeholders to participate. For these reasons, PG&E will prioritize coordination on statewide program design and implementation, while continuing to attend to the local and regional needs of our diverse customer bases.

Statewide Commercial Subprograms

Commercial Calculated Incentives Subprogram

The Commercial Calculated Incentives subprogram provides financial incentives for non-residential customers to install new equipment or systems that exceed applicable code and/or industry standards in existing buildings. PG&E's Commercial Calculated Incentives subprogram includes both customized incentives (formerly "Customized Retrofit") and RCx offerings. RCx represents an important element of PG&E's EE toolkit by reducing energy usage and increasing the efficiency of mechanical equipment, lighting, and control systems in existing facilities. To these ends, PG&E offers financial and technical assistance for customers to undertake RCx projects and implement measures that improve facility operations.

Customized New Construction (CNC) has been a subset of the customized incentives offering since 2015. CNC serves the commercial new construction segment for projects requiring more customized calculations, such as spaces with an industry standard practice (ISP) baseline rather than Title 24 (e.g., biotech buildings).

2016 Strategies and Successes

In 2016, the customized retrofit offering within the Commercial Calculated Incentives subprogram was renamed the "customized incentives" offering. This new name sought to better represent the offering's diversity, which includes both new construction and load addition or expansion. This change resulted in more consistent rules and procedures for different project types. SBD remains its own offering and is unaffected by this change.

In addition, the customized incentives and RCx offerings paid incentives for 169 projects. Six of these projects accounted for 39 percent of the subprogram savings. Although savings for the subprogram remains consistent with prior years, there has been a noticeable decline in projects in the last three years due to code and program/measure eligibility changes. Large customers in the healthcare and data center segments have been emphasized recently.

PG&E has been working to improve its delivery of RCx, leveraging lessons learned and best practices from ex ante review guidance. In particular, PG&E developed RCx-specific trainings for its engineering teams, program managers, and third party vendors. PG&E also optimized the RCx process and procedures by simplifying and refining program implementation in 2016 to deliver projects more effectively. These trainings help align the team on policy, baselines, measures, reports, calculation tools, and methods. In addition, PG&E established more rigorous quality control amongst its RCx consultants, focused specifically on reporting quality and program compliance.

Savings by Design Subprogram

The SBD program serves the commercial new construction segment by promoting integrated design through owner incentives, design team incentives, and design assistance to participants. The purpose of the program is to influence and encourage customers to design and build commercial buildings above and beyond what is required by California's Title 24 standards. The minimum requirement to participate in the subprogram is 10% greater than Title 24 standards.

2016 Strategies and Successes

SBD coordinated with internal and external stakeholders to develop energy modeling tools to support SBD program implementation, and 2016 provided a full year of successful

implementation of these new tools. Specifically, PG&E incorporated alternative baselines into the modeling software methodology to simplify customer participation and significantly decrease review time.

PG&E collaborated with the statewide SBD team to place a continued focus on the Whole Building approach an integrated design element of the subprogram. With the launch of the deemed new construction offering (lighting only), SBD systems approach projects naturally shifted to the deemed offering. The SBD subprogram will continue to work with ZNE and codes and standards (C&S) stakeholders to align efforts for future program design strategies.

Commercial Deemed Incentives Subprogram

The Commercial Deemed Incentives (Deemed) subprogram offers prescriptive rebates directly to customers, vendors, or distributors for the installation or sale of energy efficient equipment. The Commercial Deemed subprogram offers a broad array of measures across technology segments including lighting, HVAC, food service, refrigeration, and water heating. The Qualified Products List (QPL) has been a successful tool for the marketplace to implement the deemed program.

2016 Strategies and Successes

PG&E strengthened delivery of the Deemed subprogram in 2016 by bolstering activity in its three primary delivery channels: (1) PG&E account representatives discussing rebate offers with customers; (2) trade professionals integrating PG&E rebates into their business models; and (3) distributors stocking and selling efficient equipment at reduced cost as well as providing point of sale instant rebates to customers purchasing qualifying products.

The subprogram continues to be successful in encouraging customers to adopt advanced lighting efficiency technology, as evidenced by the fact that more than 80% of the subprogram's savings were attributed to light emitting diode (LED) lighting. LED integrated troffer retrofit kits, a premier linear ambient solution that launched in 2015, were adopted by the market at an accelerated pace in 2016 and comprised 27% of all Commercial Deemed savings for the year.

PG&E's diverse Deemed portfolio in areas other than lighting out-performed expectations as well. PG&E's increased rebates for food service equipment (specifically fryers) and the water heater and boiler midstream program were key drivers of a record-breaking year in therm savings, bringing in over 1,354,691 therms (a 26% increase from 2015). These measures combined with previously increased rebates for ovens, holding cabinets, and demand control kitchen ventilation (hood retrofits), and griddles continue to drive the food service segment toward overcoming high capital costs to invest in new, more efficient equipment.

The Deemed subprogram maintained its applicability to all customer segments including small, medium, and large commercial customers, while incorporating a new lighting offering for new construction projects. This offering was piloted with success in 2016 and will be a main focus for the subprogram in 2017. The Deemed Commercial subprogram continues to be an efficient, accessible program offering both downstream and midstream delivery channels to maximize energy savings through various entry points in the marketplace.

Commercial Direct Install Subprogram

PG&E's Direct Install offerings are administered through its Government and Community Partnership programs. These programs provide small and medium business customers with the opportunity to have a third party contractor retrofit existing systems with energy-efficient equipment at low or no cost to the customer. Given that many small and medium business customers have short-term leases and a split-incentive barrier (in which the customer does not own the equipment that they pay bills for), these programs are an effective way to address the needs of this sector and overcome the barriers of limited capital, expertise, and understanding of EE benefits. For more information about PG&E's successes in Direct Install, please see the Government and Community Partnership programs section.

Serving Our Commercial Customers:

PG&E Leverages Sustainability Circles® to Drive Success of its Commercial Continuous Energy Improvement Program

PG&E's CEI program completed twoSustainability Circle® cohorts throughout 2016 and launched 3 circles in the Fall of 2016.

In 2016, the circles were comprised of 40 commercial customers throughout Alameda, Marin, Santa Clara, San Mateo, and Sonoma counties at different stages of their 12 month program.

Each entity presented its sustainability action plans at the beginning of their enrollment and for 2016 completed a total of 291 initiatives for energy and waste reduction, with additional initiatives for improved water usage, and improvements to the use of natural resources and materials in the operation of their businesses. The completed energy and waste reduction initiatives have resulted in annual savings of $3.4 million, savings of 3,826,936 kWh and the use 29 PG&E rebates.

Continuous Energy Improvement Subprogram

The Continuous Energy Improvement (CEI) subprogram is a consultative service that targets long-term and strategic energy planning. CEI is designed to revitalize the importance of energy management by transforming the market and helping to reduce energy intensity through a comprehensive energy management approach. CEI addresses technical and management opportunities for Commercial, Industrial, and Agricultural customers, while creating sustainable practices through a high-level energy commitment from executive and board-level management.

Commercial Energy Advisor Subprogram

The Commercial Energy Advisor subprogram offers a suite of products and services to support customer education and participation in EE, DR, and self-generation opportunities, as well as to promote awareness of greenhouse gas (GHG) and water conservation activities. The program utilizes proactive outreach initiatives and data-driven interactive tools designed to engage and motivate customers to reduce their energy consumption through personalized program recommendations.

2016 Strategies and Successes

The subprogram leveraged new technology platforms in 2016 to facilitate providing IDSM education, greatly increasing PG&E's ability to scale on-site integrated audit services for customers. For example, PG&E launched a new and improved Commercial Universal Audit Tool designed to be more engaging, easier to complete, and with more industry- and customer-specific content. PG&E also updated its on-site energy audit tools in Energy Insight as part of continued enhancements to the Energy Insight platform.

PG&E has maintained a focus on building benchmarking assistance and facilitated trainings and automated data exchange to help customers better understand their energy usage. To support the identification and prioritization of EE opportunities, PG&E offered on-site, remote, and self-service energy audits, including integrated audits that combine EE recommendations with DR and DG information.

Commercial HVAC Subprogram

The Commercial HVAC subprogram delivers a comprehensive set of midstream and upstream strategies that builds on existing program, education, and marketing efforts, and leverages relationships within the HVAC industry to foster a sustainable, quality-driven market.

PG&E Acts as a Leading Voice in Evolving and Implementing Transformative HVAC Programs

As Program Administrators and active members of the Council of Advisors and the Executive Committee (EC) of the Western HVAC Performance Alliance (WHPA), PG&E's Residential and Commercial EE experts are **collaborating with a broad group of HVAC industry stakeholders**, EE professionals, facility and property management organizations, researchers, educators, utilities, and regulatory agencies to champion HVAC policies to **curb energy waste throughout California** and the Western region. The WHPA is currently working on updates to the Strategic Plan to ensure more comprehensive integration of IDSM strategies and Existing Building Energy Efficiency Action Plan objectives.

Strategies and Successes

The Commercial HVAC subprogram is comprised of three elements that enable market transformation, direct energy savings, and demand reductions: Upstream HVAC Equipment Incentives, Commercial Quality Installation, and midstream Commercial Quality Maintenance (C-QM).

Upstream HVAC Equipment Incentives

This subprogram element offers incentives to distributors who sell qualifying high-efficiency commercial HVAC equipment to increase the stocking and promotion of such equipment.

2016 Strategies and Successes

- Promoted program to distributors that currently participate and those who have limited or no participation.
- Evaluated new technologies and associated equipment categories, such as those with higher tiers for packaged equipment to achieve greater savings and move the market toward higher efficiency units.
- Collaborated statewide to share best practices across IOUs for program design and training.
- Used metrics to benchmark distributor performance relative to peers to drive competition.
- The Upstream HVAC Equipment Incentives offering was impacted by the adoption of new DEER tiers in 2016 that reduced savings opportunities. The IOUs will continue collaborating in 2017 to collect market sales data and performance maps to support the creation of work papers to capture these savings.

Commercial Quality Installation

This offering addresses commercial installation practices to ensure HVAC equipment is installed and commissioned in accordance with industry standards.

2016 Strategies and Challenges

- Commercial HVAC Quality Installation Contractor Education and Customer Awareness programs were delivered based on Air-Conditioning Contractors of America (ACCA) standards.
- The CPUC, IOUs, and industry stakeholders in the WHPA collaborated to validate the market transformation groundwork being laid and ensure HVAC performance standards can be verified in a sustainable manner.
- PG&E experienced enrollment challenges in 2016, despite marketing efforts using direct mail, the CQM program implementer, and word of mouth from prior students. The team will explore new approaches in 2017 to reach more contractors.

Commercial Quality Maintenance

C-QM focuses on commercial maintenance practices to ensure equipment is serviced in accordance with industry standards. Furthermore, it seeks to transform Commercial HVAC maintenance from a commodity-based industry to a quality-based industry.

2016 Strategies and Successes

- Introduced 2,324 new units into the program
- Completed redesign of C-QM to include multiple tiers of service for customers. This will provide more flexibility for customers and less confusion in the market. New program design is called “HVAC Optimization” and launched in 2017.
- Provided incentives for system assessment, system optimization, and continued rooftop unit maintenance based on American National Standards Institute (ANSI), American Society of Heating, Refrigerating, Air Conditioning Engineers (ASHRAE), and ACCA Standard 180
- Conducted 44 training sessions for commercial contractors on advanced diagnostics and other quality maintenance practices to ensure participating contractors and technicians have the skills necessary to assess, maintain, and optimize systems per industry standards
- Supported commercial contractors with marketing materials and outreach efforts to educate customers on the value of quality maintenance and using licenses and certified technicians
- Participated in monthly WHPA subcommittee meetings, discussing input and feedback regarding improvement to the C-QM initiative
- Simplified the data gathering process for contractors on the rooftop by providing options to use the Information Technology (IT) interface, as well as paper questionnaires
- Implemented contractor re-training to increase program quality maintenance standards.

Industrial Program

California's industrial sector is extremely diverse. In most cases industrial facilities are heavy energy users. Throughout 2016, PG&E focused on EE solutions for its industrial sector customer base to help reduce energy consumption and GHG emissions, and increase customers' profitability by lowering energy costs. The 2016 statewide Industrial EE programs partnered with industry stakeholders to promote a comprehensive list of energy management solutions to end-use customers. This suite of program services not only to overcome the traditional market barriers to EE, but also uses efficiency to advance IDSM opportunities such as DR and DG. Key offerings included rebates and incentives for efficient equipment and systems, technical support such as facility audits and energy savings analysis, zero interest project financing, and strategic energy planning.

These programs targeted and successfully completed projects in various facilities including oil production, printing plants, plastic injection molding, component fabrication, lumber and paper mills, cement and quarries, metals processing, petroleum refineries, chemical industries, assembly plants, and water and wastewater treatment plants.

Serving Our Industrial Customers:
PG&E's industrial customers benefit from local, regional, and niche program offerings delivered through its Third Party Program channel.

PG&E leverages its industrial Third Party programs to address niche markets, test new and innovative measures, program strategies and design, and provide turn-key/concierge services which help to meet customer needs, and identify and target hard-to-reach or stranded potential. In 2016, Third Party programs specifically targeting oil fields, refineries, heavy industry, water/wastewater plants and food processors **completed over 250 efficiency projects**.

As a result of IDEEA 365 solicitation, three new programs were successfully launched and performed extensive outreach activities. Additional details may be found in the Third Party programs section of this report.

PG&E marketed and delivered these offerings through a number of channels, including direct communication with facility personnel, presence at industry events, support for education and research activities, and close partnerships with engineering and installation firms. PG&E's portfolio of offerings also includes specialized Third Party programs focused on specific technologies, segments, or approaches with specialized requirements. These Third Party programs bring deep knowledge of California's Industrial sector and are described in more detail in the Third Party programs section.

Strategies and Successes

Industrial customers are sophisticated in their understanding of energy usage within their facilities. While these customers understand and appreciate EE, decisions to upgrade to energy efficient equipment must be balanced with minimizing operational and production risks.

PG&E works closely with customers to understand their business needs so that programs are carefully designed and offerings align with customers' requirements while minimizing risk. PG&E depends on a team of EE experts including account representatives, field engineers, contractors, and Third Party implementers with deep technical knowledge and understanding of

the industrial sector to offer industrial customers the right EE solution at the right time—from EE audits and scoping EE projects via its Energy Advisor Program, to financial offerings to install EE projects through its calculated and deemed customer incentive programs or its OBF program.

Engagement strategies depend on the size and type of industrial customers. PG&E's dedicated account representatives serve as trusted energy advisors and work closely with customers to offer solutions based on the customer's energy cost savings requirements, budget availability and timing.

In 2016, PG&E supported and processed 566 Industrial projects through the statewide program. The majority of the gas savings is attributed to oil production, while electric savings are mostly credited to improved process modification and controls pump and fan retrofits, and LED lighting upgrades. The various cost savings and increased safety associated with reduced maintenance of higher efficient equipment was a successful method of championing EE projects within all industrial sectors.

In addition to working with customers to support their analysis and project development needs, PG&E also invested in technical analysis and resources to promote new technologies for the industrial sector. For example, a technical assessment of the Solar Jack, which employs a solar PV regenerative capacitor bank and variable frequency drive (VFD) technology, was completed in 2016. Additionally, PG&E continued to arm account representatives with Technology Introduction Support (TIS) kits, which include fact sheets, PowerPoint decks, application slides, and an application checklist to easily explain the benefits of specific EE technologies to customers. Currently there are TIS kits for pump VFD add-on, fan VFD add-on, submersible pump with permanent magnet motor, and condensing economizers for boilers.

Implementation Challenges

The industrial sector has several common implementation challenges. New technologies are slow to evolve, and are cautiously adopted. Since many industrial customers operate their facilities 24/7, minimizing disruption in their production processes is of paramount importance. The capital costs associated with many EE projects represent significant challenges to industrial customers. Program participation has become more complex and time consuming. In PG&E's territory, for example, the oil sector and municipal wastewater treatment represent a large portion of energy savings opportunities but are the most affected by these challenges.

Throughout 2016, the rate of new oil sector EE projects has continued to decrease as many measures are now considered ISP. In addition, the reduction of crude oil price per barrel has slowed production and limited the type of projects in which oil producers are willing to invest.

Municipal wastewater facilities are ripe with EE opportunities, but are also challenged to ensure EE implementation has minimal or zero disruption to the services they provide. Historically, equipment upgrades that are not included in the capital budgeting process have had difficulty securing financing.

PG&E is well prepared to handle these challenges by continuously looking for ways to offer new technologies and financing opportunities, and improved education and training initiatives. For example, PG&E account representatives are educating municipalities on leveraging financial programs such as PG&E's OBF program to overcome the capital cost hurdle.

Opportunities Moving Forward

PG&E is focused on three key opportunities to support an evolving marketplace:

- Engage with national and statewide stakeholders to develop new prescriptive measures that benefit industrial process and equipment efficiency. For example, PG&E is currently working with Consortium for Energy Efficiency (CEE) to develop a prescriptive pump upgrade measure based on the new U.S. Department of Energy (DOE) pump standards.
- Evolve program offerings to enable strategic energy planning and rebuilding eligible retro-commissioning opportunities. For example, during Q4 of 2016, a quorum of statewide IOU experts and the Commission staff worked with a consultant to define guidelines and evaluation methodology for a Strategic Energy Management program. This program is proposed to launch in late 2017 to early 2018.
- Focused training on proper project development guidelines to improve compliance with policies and procedures. PG&E recognizes that some challenges continue to persist around compliance with program and policy rules. Therefore, PG&E had taken steps in 2016 to work closely with the Commission ex ante review team to collaborate on a more effective project development procedure. Starting in 2017, PG&E will institute instructor-led training and real-time project support to better prepare our various project development partners in ensuring compliance with policies.

Statewide Industrial Subprograms

Industrial Calculated Incentives Subprogram

The Industrial Calculated Incentives subprogram provides customized incentives for non-residential EE retrofit and new construction projects involving the installation of high-efficiency equipment or systems. Incentives are paid on the energy savings and permanent peak demand reduction above and beyond baseline energy performance, which include state and federal-mandated codes, ISP, or other baseline energy performance standards. Focus areas for the 2016 program included process and non-process loads at various industrial facilities that reduced energy usage associated with process modification and controls, high bay and outdoor lighting measures, and pumps and fans..

2016 Strategies and Successes

As part of its Industrial Calculated Incentives subprogram, PG&E focused on direct engagement of customers by pursuing two primary strategies. First, by leveraging its team of experienced, local, and dedicated account representatives and field engineers via local workshops, trade shows and industry events. Second, continuing to develop and enhance its partnerships with industry associations and equipment vendors. PG&E was also able to use portfolio data analytics to improve pipeline visibility, target high-potential customers and industry segments, and inform new program development. PG&E will continue to leverage its data resources to better understand and target high-energy use customers. Finally, PG&E instituted process improvement initiatives for project reviews, including application of consistent baselines, measure costs, and ISP determinations across projects. These process improvement initiatives stemmed from lessons learned and best practices identified in the CPUC custom impact evaluation and the ex-ante review process.

Deemed Incentives Subprogram

The Industrial Deemed Incentives subprogram provides rebates for the installation of new EE equipment and measures. Deemed retrofit measures have fixed incentive amounts per unit/ measure and are intended for projects that have well-defined energy and demand savings. In many cases, projects are identified through utility EE audits, customer communications with PG&E account representatives, or partnerships with equipment vendors and trade allies.

2016 Strategies and Successes

PG&E recognized an opportunity to better leverage its trade allies network to help educate industrial customers on, and install, lighting, boiler/steam, and refrigeration products. PG&E worked with all levels of the supply chain to find the best fit for a product to make the most impact along with adding new Trade Professionals to increase our EE outreach. In addition, PG&E supported the deployment of several Emerging Technologies projects in partnership with universities to inform new measure development.

Continuous Energy Improvement Subprogram

The Industrial CEI subprogram is a consultative service which targets long-term and strategic energy planning. CEI is designed to reintroduce the importance of energy management through a comprehensive energy management approach involving identification and tracking of energy productivity metrics, identifying stakeholders for the company's energy and associated financial impacts, planning for capital projects, and sharing of best practices within the organization and amongst cohorts of peers. CEI's Sustainable Circles program addresses technical and management opportunities for industrial customers while creating sustainable practices through a high-level energy commitment from executive and board-level management.

2016 Strategies and Successes

In 2016, PG&E deployed a cohort model implementation approach for six mid-sized industrial and seven food processing customers. Training and energy conservation education was provided in a classroom and online, whereby participants are provided basic and intermediate energy conservation education and best practices. Classroom and internet training is further enhanced by course proctoring and onsite support with an Energy Audit that analyzes energy use over twelve months. The Energy Audit includes energy conservation recommendations and overview, with opportunities specific to a participant's operation, facility and energy conservation goals.

The idea behind the cohort model is to help customers increase their return on energy-related investments, and assist them in identifying and implementing EE-related initiatives that will persist. Importantly for industrial customers, the cohort model represents an opportunity to share success stories and lessons learned to help boost productivity and overall business performance.

Industrial Energy Advisor Subprogram

The Industrial Energy Advisor subprogram provides customer education and encourages participation in EE, DR, self-generation programs and promotes awareness of GHG and water conservation activities. The program works to assist customers in the implementation of the appropriate solutions for their business while placing an emphasis on deep energy savings opportunities and continuous improvement over time. Aligning integrated improvement opportunities with customers' needs, the Energy Advisor Program helps customers appreciate EE benefits therefore increasing program participation and adoption rates.

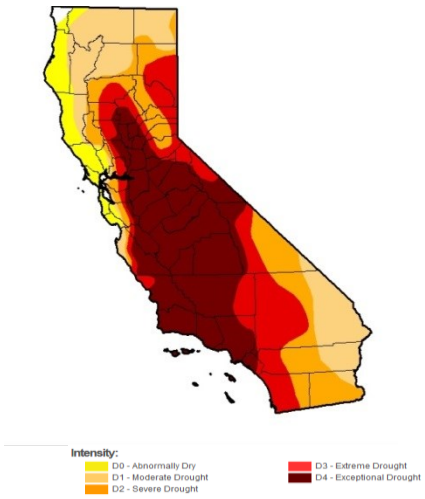
2016 Strategies and Successes

2016 saw the continued expansion and improvement of the Auditing Tools based on customer feedback to encourage greater customer adoption. PG&E continued to offer on-site and remote energy audits, including integrated audits that combine EE recommendations with DR and DG information. In addition, PG&E focused attention on close coordination with large end-use customers to understand project scope and timeframe constraints to better influence customer selection of state-of-the-art EE and demand management solutions.

Agricultural Program

In 2016, the Statewide Agricultural Energy Efficiency programs provided a portfolio of offerings to support an industry heavily impacted by unprecedented statewide drought conditions. The Agricultural programs, coupled with DR and DG programs, helped agricultural producers and processors manage energy costs and make informed investments in new equipment. Through four agricultural-focused subprograms, the statewide team offered a full suite of tools to position California agricultural customers to eliminate unnecessary energy use. Key offerings included rebates and incentives for efficient equipment and systems, technical support such as facility audits and energy savings analysis, zero interest project financing, and pump efficiency education.

Throughout 2016, PG&E Scaled Up its EE Programs to Assist Drought-Affected Customers Save Water and Energy



Source: United States Drought Monitor (March 2016)

Programs in 2016 targeted the agricultural growers (field crops, fruits and nut trees, vegetables and vineyards), post-harvest processors, dairies, irrigation districts/agencies, fruit and vegetable processors (canners, dryers and freezers), agricultural service providers, wineries and other beverage manufacturers.

PG&E worked with the Commission staff ex ante review EAR staff team to overcome some of the issues raised by the 2014 moratorium on the greenhouse projects and started developing small and medium size greenhouse projects again by following the Project Development Protocol. Large greenhouses still remain under the moratorium.

PG&E marketed and delivered these offerings through a number of channels, including direct communication with customer, advertising in industry publications, presence at industry events, support for education and research activities, and close partnerships with engineering and installation firms. PG&E complements its statewide EE offerings with concierge EE solutions through its Third Party programs focused on specific technologies, segments, or approaches with specialized requirements. These programs are described in more detail in the Third Party section.

Key Initiatives: Drought Support for the Agricultural Community

In 2016, California was in the midst of an historic drought that had significantly impacted the ways in which PG&E's agricultural customers do business. As such, PG&E focused on several key initiatives to help agricultural customers save energy and better manage their usage, prioritizing efforts to assist drought-impacted customers through existing programs and channels. PG&E has increased the number of simplified incentive offerings for irrigation VFDs for the Agricultural Deemed subprogram and supported its launch with a marketing campaign. PG&E also provided assessment and development support for behavioral and informational products, which leverage new data sources and tools to help agricultural customers manage energy use. Through our Emerging Technology Program, PG&E is assessing closed loop water

management for the status evaluation of irrigation water and energy use within agricultural farming.

2016 Strategies and Successes

- **Local presence in agricultural communities**. PG&E focused on building trust with customers in their own communities by providing information about efficient irrigation equipment and operations via trusted trade professionals, scheduling workshops with partners such as local farm bureaus and the League of Food Processors, and collaborating with agricultural universities such as California State University, Fresno.

- **Water-Energy Nexus.** The agricultural industry is a central stakeholder in California's water-energy nexus, with a footprint of nearly 80 percent of California's water usage, 4% of annual energy use statewide, and $47 billion of direct economic impact. Using existing and new programs, PG&E continues to prioritize approaches to jointly improve water and energy management for growers and manufacturers.

- **Evolving program offerings**. PG&E prioritized planning for the development of a new methodology for agricultural pump overhaul calculations. The methodology will be developed and finalized in 2017 through a partnership with California Polytechnic State University, San Luis Obispo. PG&E responded to new opportunities in the irrigation market by completing an ISP study of PVC irrigation pipe. Custom projects utilizing this measure are under development with the goal of eventually transitioning to a deemed measure.

In 2016, more than $12 million of PG&E incentives supported investments for 1,821, including 120 by Third Party programs. These savings come from a wide range of statewide coordinated and local and regional program offerings through PG&E's host of Third Party agricultural-focused programs.

Implementation Challenges

For energy-intensive process equipment (including pumps and mechanized processing facilities), equipment decisions must be made in the context of minimizing risk of interruption to production output or quality. PG&E works closely with customers to understand their business needs so that programs are carefully designed, and offerings align with customers' requirements with minimize risks.

Opportunities Moving Forward

The agricultural industry's energy usage has grown in recent years as surface water supplies have been cut, local water tables have dropped, and businesses have invested in new equipment and capacity to improve production capabilities. Pump and irrigation energy usage requires comprehensive management, technology, and operations approaches in order to achieve reductions. To further agricultural customers' EE opportunities, PG&E is continuing evaluations of new technology-enabled approaches to water and energy management, including sensing technologies, analysis tools, and process automation via partnerships with start-up companies, agricultural universities, and leading growers. Ultimately, these technologies may be a core component of PG&E's Agricultural program strategy. In the near term, PG&E will continue to support investments in VFDs and other opportunities to improve the efficiency of irrigation systems. PG&E is also exploring ways to serve customers with process lighting for dairy and indoor agricultural operations.

Statewide Agricultural Subprograms

Agricultural Calculated Incentives Subprogram

The Agricultural Calculated Incentives program offers incentives for a wide range of energy efficient technologies including steam systems, refrigeration equipment, and lighting technologies. PG&E account representatives and engineering experts work closely with customers throughout the design and installation process to evaluate, and help customers implement, the most energy efficient technologies. Customized projects were carefully tracked from audits through project completion, with PG&E EE experts involved at each step of the way.

2016 Strategies and Successes

- The Statewide Agricultural Calculated Incentives program provided incentives for 108 completed projects, with incentives ranging from less than $1,000 to nearly $177,000
- Following the geographical concentration of California's agricultural industry, projects were concentrated in the Central Valley, with nearly 73 percent of savings coming from the region stretching from Stockton to Bakersfield.

Agricultural Deemed Incentives Subprogram

The Agricultural Deemed Incentives program provides fixed rebates for high volume measures, such as HVAC, lighting, and irrigation equipment. Projects are typically identified through utility EE audits, customer communications with local PG&E account representatives, or partnerships with equipment vendors and trade allies.

Program information was communicated to a customer base of over 35,000 growers through training events, mass media advertising, and the expertise of PG&E's dedicated agricultural local account representatives and call center representatives.

2016 Strategies and Successes

PG&E continued a new rebate offering for VFD equipment for agricultural irrigation pumps, which helped farmers precisely control pumps in response to operational needs. The Deemed Program offers a better use of program administration costs for this high volume measure, while enabling a simpler customer experience.

Through PG&E's Deemed Incentive program, additional therm saving boiler measures were promoted and significantly increased participation from 2015.

Agricultural Energy Advisor Subprogram

In addition to a range of on-site and online energy audit offerings, the Agricultural Energy Advisor subprogram provides pump efficiency services, known as the Advanced Pumping Efficiency Program (APEP). This program offers pump tests and incentives for pump efficiency improvements to agricultural, municipal, and irrigation district customers.

2016 Strategies and Successes

To assist businesses and governments critically affected by the statewide drought, PG&E allocated substantial funding for pump efficiency tests and maintained elevated incentive rates for pump efficiency improvement projects. These changes were communicated through training events, mass media advertising, and PG&E's ongoing partnership with California State University, Fresno's Center for Irrigation Technology.

Based on feedback from Commission staff ex ante review team, and ex-post evaluation results, PG&E has engaged California Polytechnic State University Irrigation Technology Resource Center to develop and test a new agricultural pump overhaul calculation methodology. This new methodology will account for future planned operations and environmental conditions in addition to historic usage and pump efficiency. By developing this new methodology, PG&E is laying the groundwork to develop calculation tools which will access deeper energy savings.

Agricultural Continuous Energy Improvement Subprogram

The Agricultural CEI subprogram builds on the structure of the proven ENERGY STAR® energy management model. CEI is a consultative service which targets long-term and strategic energy planning, including development of energy stakeholder groups within organizations, identification and tracking of energy productivity metrics, planning for capital projects, and sharing of best practices within the organization and amongst cohorts of peers. CEI incorporates company-wide assessment, maps energy goals to business objectives, ensures continual evaluation and iteration and activates employee participation.

2016 Strategies and Successes

In 2016 PG&E piloted the Refrigeration Operator Coaching (ROC) program, which focused on large, refrigerated warehouses and provided refrigeration operators with knowledge, support, and tools to maximize energy efficiency and minimize energy costs. Operators from four refrigeration facilities participated in the pilot. This cohort approach brought operators from different facilities together in order to share experience and enhance learning. Over the course of four workshops and on-site EE assessments, operators were able to implement multiple recommendations originated by ROC third party implementer Cascade Energy, Inc. that resulted in substantial performance improvement of refrigeration systems and energy savings from operational and commissioning measures totaling almost 5GWh.

Lighting Program

The Statewide Lighting Program facilitates market transformation for advanced lighting products through a number of activities including: (1) assessment of pre-commercialized lighting technologies; (2) demonstration projects for advanced lighting technologies in the early stages of commercialization; and (3) incentives for cost-effective lighting measures that have reached a greater level of commercialization.

Strategies and Successes

PG&E continued to focus on advanced lighting, both LEDs and advanced Compact fluorescent lamps (CFLs). To reinforce support for the most efficacious and innovative products, and to improve the cost effectiveness of its lighting offerings, PG&E updated the incremental measure costs for its LED work papers, and is investigating alternative calculation methods working collaboratively with the statewide team and Commission staff for future work paper updates.

PG&E's Lighting Program Focuses on Opportunities to Best Transform Markets and Continuously Innovate

Using the latest input from the Lighting Market Transformation subprogram's Lighting Solutions Workbook, **PG&E is developing roadmaps for future solutions** appropriate for Lighting Innovation trials and Emerging Technologies projects.

California's Long-Term Energy Efficiency Strategic Plan's Lighting Action Plan (LAP) is the backdrop for discussions on how the utilities can help overcome barriers and increase adoption of energy efficient technologies, systems, and best practices to help reach California's 60-80 percent energy savings goal. The Lighting Market Transformation (LMT) Program is an element of the California IOUs' efforts to actualize the goals contained within the LAP. In 2016, PG&E made significant progress on the Advanced Lighting Control System (ALCS) Calculator Tool, a key initiative as part of the Statewide Lighting Program's efforts to advance the adoption of ALCS and a reliable method to quantify savings associated with ALCS.

Opportunities Moving Forward

Building on 2016 program successes, PG&E will continue to encourage and promote advanced LEDs in the market. In addition, the PG&E Lighting team is exploring ways to expand advanced LED products to other retail channels outside of big box retail such as hardware stores and independent markets, and expanding delivery channels for non-residential LED products.

Statewide Lighting Subprograms

Primary Lighting Subprogram

The Primary Lighting subprogram offers upstream rebates to reduce the cost of energy efficient lighting products, introduces new energy efficient lighting products, and strives to influence the future purchasing and installation behaviors of residential customers. An array of product types, models, and technologies are offered, including specialty CFLs and LEDs.

2016 Strategies and Successes

2016 marked the third full year of solely supporting LED lamps that met the new advanced LED specification as designed by the CEC. The program saw a steady increase in product availability from the prior year.

The number of qualified LED lamp models went from 1 to 50 from 2013 to 2014 due to the rigorous outreach to manufacturers and engaging them in the testing/qualification process early on. With this increased manufacturer confidence in the CEC Spec, the number of qualified LED lamp models increased to nearly 100 across 17 manufacturers by the end of 2016.

PG&E employed an intentional measure blend to clearly signal its view that the market is ready for LEDs while including limited advanced CFLs to balance cost effectiveness and achieving energy savings targets.

Lighting Innovation Subprogram

The Lighting Innovation subprogram evaluates advanced lighting products or program approaches new to the market, which have potential to eventually enter the Primary Lighting residential upstream program or the Commercial, Industrial and Agricultural programs. Trials and studies are administered to determine recommendations, showcases and field placement projects are conducted when applicable.

2016 Strategies and Successes

PG&E developed two key Trials in Lighting Innovation – the Lighting Designer Assistance (LDA) Trial and the Advanced Lighting Control System (ALCS) Calculator Trial. The LDA Trial was launched in November 2015 and the ALCS Calculator Trial which launched in Q2 2016. These Trials contribute towards PG&E's approach to support Goal #2 of the Lighting Action Plan to "define and advance best practices for design, installation, operation and maintenance of integrated systems to achieve sustainable lighting solutions for all spaces." Each of the electric IOUs is targeting different aspects of ALCS. PG&E's contribution with the ALCS Calculator is intended to enable to simplified savings estimation for various advanced lighting control strategies.

Lighting Market Transformation Subprogram

The LMT subprogram develops innovative data-driven program strategies to adapt utility lighting programs to the ever-changing energy and lighting markets to support the Strategic Plan. The program tracks, coordinates, and provides collaboration opportunities for utility, government, and industry LMT activities. The program oversees the progression of lighting solutions across utility programs, such as ETP, Lighting Innovation, Primary Lighting, and C&S. These programs help ensure efficient progression of lighting solutions into and out of customer EE programs.

2016 Strategies and Successes

In 2016, PG&E played an active role in setting current and future direction of the lighting industry nationally by participating in several state and national committees in the lighting industry such as the DesignLights Consortium, Consortium for Energy Efficiency, and ENERGY STAR®. More details regarding the Statewide LMT subprogram efforts will be provided in the June 1, 2017 LMT Annual Report.

Codes and Standards

The Statewide Codes and Standards (C&S) Program saves energy on behalf of ratepayers by influencing standards and code-setting bodies, such as the Energy Commission and the U.S. DOE, to strengthen EE regulations. The Program also supports compliance improvement with existing C&S regulations to maximize gross savings, assists local governments to develop ordinances that exceed statewide minimum requirements, and coordinates with other programs and entities to support the State's ambitious policy goals. Program advocacy and compliance improvement activities extend to virtually all buildings and potentially all appliances sold in California.

Key Initiatives

PG&E collaborated with the Energy Commission to initiate over 20 new Codes and Standards Enhancement (CASE) proposals for the 2019 Title 24, Part 6 rulemaking, as well as assist preparing for 2016 standards implementation and related infrastructure and resource development for 2019. PG&E also participated in the ASHRAE 90.1 and 189.1 standards technical committees and working groups to update requirements on six topics.

PG&E supported four Appliance CASE proposals adopted by the Energy Commission in 2016: LEDs, Small Diameter Directional Lamps, Computers, and Displays. In addition, three new CASE proposals are under development for irrigation emitters, EISA exempt lamps, and standby power. C&S also supported 18 federal standards that were adopted in 2016 and four that are scheduled for adoption in 2017, including collection and submittal of lab test data, market and pricing data, submitting comments, and participating in meetings and working groups.

The Compliance Improvement subprogram delivered 175 Title 24, Part 6 standards-related traditional classroom training sessions, 20 virtual classes, facilitated 20 Decoding Talks and updated all online self-study courses to reflect changes and additions to the standards. The Energy Code Ace tools and resources were updated for the 2016 standards, in addition to launching a new application guide series. In close collaboration with the CEC, the statewide C&S Compliance Improvement team developed dynamic compliance resources and checklists, and supported the development of dynamic forms expected to be released in 2017. The Compliance Improvement team also developed or updated 12 on-demand videos in support of the Energy Commission's Modernized Appliance Efficiency Database System (MAEDBS), seven fact sheets, and an online self-study course covering the water-energy nexus.

The C&S Program team continued to support expansion of the Reach Code subprogram, as 2016 Title 24 standards led to increased focus by local governments on climate action plans. The statewide team is coordinating with the Energy Commission to provide the technical analysis needed to support local jurisdictions adopting local energy ordinances.

PG&E signed participation agreements with two residential and one commercial office project. A pipeline of future projects was developed so that 2017 would be a year of progress.

Strategies and Successes

Support for state and federal building codes and appliances standards continues to move California towards residential ZNE by 2020, non-residential ZNE by 2030, and the statewide goal set forth by SB 350 to reduce building energy usage by 50 percent.

Compliance improvement activities have contributed to Title 24, Part 6 compliance adjustment factors[6] that exceed 100 percent, and compliance rates for appliance standards between 80 percent and 90 percent.

Building efficiency and appliance standard advocacy efforts, and higher than expected compliance rates, have resulted in significant energy savings attributable to the C&S program. Net C&S savings are approximately half of total net energy efficiency portfolio savings.

Increased scrutiny on the CASE studies has required additional data collection. Field studies, product testing, and other primary research have resulted in stronger CASE studies and more stringent standards.

Implementation Challenges

Increased stakeholder engagement in the Energy Commission and DOE's rulemakings contributed to more rigorous research requirements (lab testing, field surveys, etc.). While this research contributed valuable insight to the rulemakings, it also increased costs for the C&S program. In addition, the complexity of building codes and the number of appliance standards continues to increase. For example, DOE standards for new product categories continued to increase preemption of state appliance standards and constrain prescriptive baselines for building codes, limiting opportunities for California to capture greater cost effective savings.

The scope of those requiring Title 24, Part 6 training also expanded to include architects and designers, commissioning agents, acceptance test technicians, and electric distribution inspectors. Growing interest from these stakeholders required the creation of new training modules tailored to their interests and needs.

Opportunities Moving Forward

There are several opportunities to increase savings from state and federal building codes and appliance standards, such as:

- Continued expansion of primary research to ground proposals in data.
- Expansion of Title 24, Part 6 education and training, and expanding support for increasing compliance with appliance standards.
- Increasing emphasis on code simplification and improving the efficiency of existing buildings.
- Development of new Reach Codes based on 2016 Title 24 building energy efficiency building code.
- Continued collaboration with the Compliance Improvement team and market actors to contribute to the initial advocacy stage of the Building Energy Efficiency Standards rulemaking process.
- Expansion of code readiness activities to improve quality of advocacy.

6 Compliance adjustment factors account for buildings that exceed minimum code requirements on a whole building basis.

Statewide Codes and Standards Subprograms

Appliance Standards Advocacy Subprogram

The Appliance Standards Advocacy subprogram targets both state and federal standards and test methods including improvements to Title 20 Appliance Efficiency Regulations by the Energy Commission, and improvements to federal appliance regulations and specifications by the DOE, EPA ENERGY STAR®, ASHRAE, and the Federal Trade Commission (FTC). Advocacy activities include developing Title 20 code enhancement proposals, participating in the Energy Commission public rulemaking process and ASHRAE committees, submitting comment letters in federal standards proceedings, and participating in direct negotiations with industry. Additionally, the program monitors state and federal legislation and intervenes, as appropriate.

2016 Strategies and Successes

- The C&S program advocated for changes to Title 20 Appliance Efficiency Regulations.
  - Participated in several Energy Commission webinars and workshops regarding LEDs, small-diameter directional lamps, computes, displays, portable spas and pool pumps rulemakings.
  - Developed CASE studies for the Energy Commission on products including consumer electronics, EISA exempt lamps, sprinkler spray bodies, commercial clothes dryers, televisions computers and displays.
  - Completed laboratory testing for commercial clothes dryers with results submitted as part of the CASE studies.
- The C&S program advocated for changes to federal appliance standards.
  - Researched and responded to specific issues related to federal rulemaking and specification processes conducted by the DOE, EPA ENERGY STAR®, and the FTC.
  - Participated in stakeholder meetings during rulemakings and specifications process, resulting in 30 rulemaking advocacy letters issued in 2016.
  - IOU advocacy letters issued in previous years influenced rulings on seven federal measures taking effect in 2016.
  - Participated in DOE's Appliance Standards and Rulemaking Federal Advisory Committee working groups with DOE, industry, and other stakeholders.

Building Standards Subprogram

The Building Codes Advocacy subprogram primarily targets improvements to California's Building Energy Efficiency Standards (Title 24, Part 6). Title 24, Part 6 is updated by the Energy Commission on a triannual cycle. The subprogram also pursues changes to national building codes that impact California through ASHRAE and other national and international code-setting bodies. Advocacy activities include, but are not limited to, development of code enhancement proposals and participation in public rulemaking processes. The program may coordinate with or intervene in ratings organizations referenced in Title 24 (e.g., the National Fenestration Rating Council, and the Cool Roof Rating Council).

2016 Strategies and Successes

- Supported implementation of 2016 Title 24 Building Standards in the following areas:
  - Calculations for new lighting retrofit requirements
  - Improved Energy Code Impact analysis (doubled calculated nonresidential savings)

  - Supported the creation of the JA8 and JA10 database categories in the Energy Commission's Appliance Database (MAEDBS).
  - Provided a domestic hot water model, including an improved heat pump water heater model and initial testing of drain water heat recovery units.
  - Provided research and support for the Water efficiency and Model Water Efficiency Landscape Ordinance (MWELO) proposed requirements.
  - Provided support in pursuit of ZNE goals, including a CALGreen ZNE tier and prerequisite requirements, plug load model, among others.
- Developed 2019 Title 24, Part 6 standards by organizing stakeholder meetings to refine the measure list and specifications.
- Supported CASE measure development by:
  - Engaging stakeholders to gather information that will inform code change proposals, market analysis, and cost effectiveness analyses.
  - Preparing first drafts of CASE Reports for Energy Commission review.
  - Collaborating with the Compliance Improvement team to identify and address compliance and enforcement implications of proposed code changes.
- Provided technical support to the CEC in the following ways:
  - Development of an energy calculation spreadsheet for screening energy savings estimates.
  - Development of Time Dependent Valuation (TDV) demand factors spreadsheet for calculating generation peak demand.
  - Development of Outdoor Lighting and Indoor Lighting energy savings spreadsheets that include TDV, peak demand and PV cost savings.
  - Guidance and support on cost-effectiveness study of different definitions of ZNE (regulated loads, regulated + white goods, total, etc.).
  - Drawing participants together from IAQ standard development for LEED, ASHRAE 62.1 and the Building Energy Efficiency Standards to allow use of Title 24, Part 6 IAQ standards for compliance with other standards.
- Provided support to ASHRAE 90.1 and 189.1 standards on six topics.

Compliance Improvement Subprogram

C&S supports compliance improvement with the Building Energy Efficiency Standards and the Appliance Standards after they are adopted. Compliance improvement activities complement advocacy work by maximizing verified savings from C&S that are realized and persist over time. The Compliance Improvement subprogram targets market actors throughout the entire compliance chain, providing education, outreach, and technical support and resources to improve compliance with both the building and appliance energy standards. Achieving satisfactory compliance with codes and standards is a crucial requirement for capturing the intended energy savings for the long-term benefit of society. High compliance rates are necessary to level the playing field for well-intentioned suppliers and contractors who are otherwise faced with a competitive disadvantage when complying with regulations. Greater compliance strengthens voluntary program baselines and provides a solid foundation for future robust advocacy efforts.

2016 Strategies and Successes

Title 24, Part 6 Building Energy Standards Compliance Improvement Efforts

- Updated existing training assets (classes, tools, resources, etc.) and created new 2016 Title 24, Part 6 training courses designed to support market actors throughout the compliance industry. Training is offered via traditional classroom sessions at training

centers and other locations as requested, virtual classroom sessions (live, online classes, also known as v-classes), webinars, and online self-study, allowing users to take courses at their convenience.

- Developed courses for all training types, including updating existing courses designed for 2013 standards and creating new courses on the 2016 standards.
- Conducted 175 classroom (in-person) training sessions with approximately 4,100 attendees.
- Conducted decoding webinars covering five topics related to the 2016 Standards update. Each webinar was offered in four separate sessions, resulting in completion of 20 decoding webinars with a total of 659 attendees.
- Updated five virtual classroom (v-class) courses to reflect changes in the 2016 Standards. The Title 24 Compliance Improvement team conducted 20 v-classes with a total of 441 attendees. Each class was held over a three-day period.
- Began development of two virtual workshops: Residential Modeling Tips and Analyzing the CF1R: A Conceptual Overview.
- Updated the existing Energy Code Ace fact and triggers sheets for the 2016 standards, and developed seven new application guides.
- Continued outreach via Energy Code Ace by participating in industry events, distributing 70 targeted messages, and updating EnergyCodeAce.com. Specific activities and outcomes include the following:
- Participated in 36 industry outreach events in 2016 (including exhibiting, presenting, sponsoring and distributing materials collateral at the 2016 American Council for an Energy-Efficient Economy [ACEEE] conference in California)
- Built and strengthened strategic partnerships with organizations such as the CEC, CABEC, American Institute of Architects, California Council (AIACC and local chapters), Institute of Heating and Air Conditioning Industries (IHACI), California Building Officials (CALBO), International Code Council (ICC) Chapters, Statewide Energy Efficiency Collaborative (SEEC)
- Coordinating with the Building Advocacy subprogram to strengthen the process by which market actors contribute input to the codes and standards improvement process and minimize compliance issues created by the standards language itself. Coordination includes webinar collaborations discussing code users and compliance tasks, CASE topic reviews, attendance and collaboration in stakeholder meetings. Integration will continue during 2017.
- Updating Certified Energy Auditor (CEA) residential and nonresidential examinations for 2016 standards. As part of this effort, the team revisited and updated the exam blueprint, criteria, and candidate skill set descriptions.

Title 20 Appliance Standards Compliance Improvement

The Compliance Improvement team completed the following activities in 2016, which was the first full year of the Title 20 compliance support activities:

- Launched twelve Energy Code Ace on-demand video modules to support Title 20 compliance improvement.
- Developed a 60-minute online self-study course on the water-energy nexus, which is available through the Energy Code Ace website.
- Hosted and recorded “Test, Certify and Comply,” an online event focusing on the high efficacy residential lighting requirements in Title 24, Part 6 Joint Appendix 8. This topic crosses over between Title 20 and Title 24, Part 6.

- Developed Title 20-related resources such as fact sheets documenting requirements for the equipment and Title 20 certification processes and a Title 20 Appliance Standards document for the 2016 Reference Ace tool to allow users to easily reference performance requirements.
- Supported the creation of a PG&E support tool (ZenDesk Help Desk) and dedicated email support for questions related to Title 20.
- Initiated monthly analysis of Title 20 hotline calls in collaboration with the Energy Commission to determine whether resources are addressing market needs.
- Provided Title 20 outreach at conferences and events attended by Energy Code Ace.
- Added Title 20 web resources:
  - Title 20 On-Demand Videos page views comprised approximately 0.1% (272) of all page views (268,379). For context, the Energy Code Ace homepage comprised 34% of the 268,379 page views in 2016.
  - Title 20 documents (e.g., fact sheets, FAQ, handouts) comprised approximately 4% (3,992) of the total file views (100,762). For context, the fact sheet "What's New: 2016 Residential Code" was downloaded most often (8,392) in 2016.
- Worked with the Energy Commission to develop the Voluntary California Quality Light-Emitting Diode (LED) Lamp Specification 3.0, and to align the specification with Title 20, Title 24, and voluntary program requirements.

Reach Codes Subprogram

In addition to state and national building codes, the C&S Program provides technical support to local governments that wish to adopt ordinances that exceed statewide Title 24 minimum energy efficiency requirements for new buildings, additions, or alterations. Reach code support for local governments includes research and analysis to establish performance levels and cost effectiveness relative to Title 24 by climate zone, drafting model ordinance templates for regional consistency, and assistance for completing and expediting the application process required for approval by the CEC. The subprogram also supports local governments seeking to establish residential or commercial energy conservation ordinances for existing buildings.

The program monitors and/or participates in a wide range of activities or proceedings with direct or indirect impacts on California regulations including, but not limited to ASHRAE, international activities involving Europe, Asia, Canada, and Australia, voluntary standards such as green building codes, and ratings organizations such as the Cool Roof Rating Council, National Fenestration Rating Council, Collaborative for High Performance Schools, and the United States Green Building Council. Additionally, the program intervenes in ENERGY STAR® and other voluntary activities to shape future regulations or support coordination with voluntary programs.

2016 Strategies and Successes

- Worked with local jurisdictions to prepare for adoption of codes exceeding 2016 Title 24 as part of the normal three year cycle of local jurisdiction adoption of California Uniform codes.
- Provided a cost-effectiveness study in support of an existing City of Davis ordinance that requires residential new construction projects to meet CALGreen Tier 1 requirements, supporting CEC approval in 2016.
- Created several technical resources for local jurisdiction use, including Nonresidential Outdoor Lighting Cost-Effectiveness Study, Cool Roof Cost-Effectiveness Study, a Plug-In Electric Vehicles Infrastructure Study, and the 2016 CALGreen Cost-Effectiveness Study for Low-Rise Residential New Construction

- Conducted a study using an escalation rate for utility costs (over and above the inflation rate), to increase the excess generation buyback rate to equal the retail rate for the City of Davis. The City of Davis requested the team to run the study using an escalation rate for utility costs (over and above the inflation rate), and also to increase the excess generation buyback rate to equal the retail rate.
- Consulted with Energy Commission staff on proposed solar ordinance features, including a recommendation requiring a "reach" level of energy efficiency beyond the minimum code to ensure loading order maintained and encourage achieving all feasible savings and a cost-effectiveness study and methodology for determining minimum PV system size (without oversizing). Also provided recommendations on ordinance language and investigated options to implement software revisions to facilitate implementation.

Planning and Coordination Subprogram

The Planning and Coordination subprogram works with the Energy Commission, CPUC, Emerging Technologies program (ETP), WE&T program, and other EE programs to conduct strategic planning in support of the California Energy Efficiency Strategic Plan's policy goals, including ZNE goals for new construction. As part of the expanded outreach and communications efforts, the C&S Program maintains a C&S collaborative, and continues to facilitate the statewide Compliance Improvement Advisory Group. In addition, the C&S Program maintains regular contact with state and federal code-setting agencies to coordinate activities and minimize duplication of efforts.

2016 Strategies and Successes

- Conducted tactical planning in support of the CPUC's residential ZNE policy goal. Activities include development of a draft plan, review by CPUC and Energy Commission staff, and revisions to the draft plan based on these inputs.
- Collaborated with the WE&T statewide team on training calendar offerings for the building industry community and training for community colleges on 2013 Title 24 code requirements.

Code Readiness Subprogram

The Code Readiness program is a non-resource effort that seeks to enhance PG&E's efforts to achieve state policy goals by implementing project level activities that enhance C&S advocacy and increase market feasibility of measures through targeted data collection, customer inducements, and knowledge transfer to builders and other market actors. This approach maximizes program agility and, consequently, responsiveness to CPUC and Energy Commission objectives. Code Readiness activities target strategic opportunities complementary to ETP and other programs in the portfolio, such as measures for which there is limited time to increase code readiness through voluntary programs, low volume measures that may be important for a specific goal, and activities or measures with a Total Resource Cost (TRC) benefit/cost ratio much less than 1.0.

2016 Strategies and Successes

Commenced work on three projects: production home in Porterville, custom home in Redding, and a small office building in Davis, with others to begin in 2017, that include the following measures or systems:

Residential

- High performance walls with QII

- High performance ventilated attic
- High efficiency HVAC (2 stage 17 SEER AC, 2 stage 95% AFUE gas furnace)
- Energy recovery ventilators to meet ASHRAE 62.2
- Compact hot water distribution
- Enhanced high performance windows (U value and SHGC < 0.30)
- Tight building envelope (target of <2 ACH50)
- Reduced duct leakage (target of < 1% of airflow)
- Advanced wall framing (reduced framing factor)
- Interior mechanical room with centrally located water heater
- CO_2 heat pump water heater with 43 gallon tank
- Heat recovery ventilation system for efficient and healthy indoor air quality
- Single one-ton short ducted mini-split (vs original plan of two 3/4 ton short ducted mini-split heat pumps)

Nonresidential

- Dedicated Outdoor Air Supply with variable speed fans, heat recovery (HX), economizer mode bypass of HX, and smart controls
- Variable Capacity Heat pump system with multiple heads and HX for simultaneous heating and cooling
- Power Over Ethernet (POE) LED area lighting fixtures
- LED task lighting

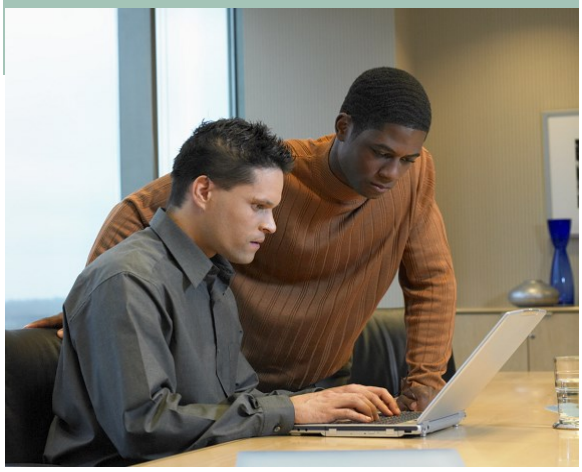
Emerging Technologies Program

The Emerging Technologies Program (ETP) is a statewide initiative designed to reduce time-to-market for introduction of EE technology solutions aligned with the California Energy Efficiency Strategic Plan. ETP increases supply of and market demand for EE technology solutions, delivered through three core subprograms: Technology Development Support (TDS), Technology Assessment (TA), and Technology Introduction Support (TIS).

Under the statewide ETP, the TDS subprogram intends to increase technology supply by further educating the private sector (i.e., technology providers, investors, etc.) on technical and programmatic requirements for rebated EE measures. In parallel, the TA subprogram identifies and assesses the performance of emerging EE technology solutions in all sectors that may be offered to customers with an incentive. Finally, the TIS subprogram seeks to introduce solutions to the market by exposing end users to applications of emerging EE technology solutions in real-world settings, and by harnessing third party projects to deploy such technology solutions on a limited scale in the market.

Testing Innovative Solutions through the Emerging Technologies Program

PG&E's Emerging Technologies (ET) team actively seeks out **new, innovative technology solutions** and market approaches, soliciting ideas from both internal and external EE stakeholders to assess potential new technologies for PG&E's EE portfolio in a strategic way. ETP enables PG&E to **test and benchmark new and innovative products**, **services, and market solution** to help bring our customers new and improved opportunities to save energy.



ETP uses numerous strategies − such as Lab Testing, Field Testing, Demonstration Showcases, and Technology Resource Incubator Outreach (TRIO) − to achieve the objectives of its three subprograms.

ETP enables PG&E to reduce certain market risks by testing and benchmarking new and innovative products, services, and market solution approaches. This helps downstream programs understand potential barriers – technical or non-technical – to high adoption rates for new EE technology solutions. ETP, via the flexibility that it provides to test new market solutions, aligns itself well with one of PG&E's core EE values of "embracing the art of the possible."

Opportunities Moving Forward

In 2017, PG&E will maintain its focus on expanding the pool of new and innovative ideas and solutions that can be offered to customers. Based on EE market and technology trends, PG&E will place particular emphasis on integrated solutions (HVAC with lighting, DRDG, etc.), data analytics, and software-based solutions to help deliver greater value to the customer and drive higher adoption rates. The advent of software controls combined with high-quality, reliable end user energy consumption and demand data, enables PG&E to target increasingly granular end use solutions and further engage customers in realizing long-term Strategic Plan goals.

Emerging Technologies Subprograms

Technology Development Support (TDS) Subprogram

The TDS subprogram assists entrepreneurs, investors and technology providers in developing new or improved EE technologies and solutions for the marketplace. IOUs are strongly positioned to undertake targeted, cost-effective activities that provide value in support of private industry product development efforts, decreasing innovator uncertainties. Broadly, the ETP seeks targeted opportunities to support EE product development. Product development constitutes the process of taking an early-stage technology or concept (including at the Research and Development (R&D) stage) and transforming it into a product that meets a market need. ETP supports product development through TRIO roundtables, symposia, and other means. TRIO provides support and networking for EE and DR entrepreneurs, investors, and universities with the goal of providing participants with the requisite perspective and tools to work with IOUs. TRIO symposia educate technology developers about the requirements that IOUs must apply when considering new technologies and solutions for inclusion in IOU EE programs. TRIO roundtables are targeted to a smaller audience and have focused on market demand and technological innovation, prior to a full ET assessment (see below). Supplementary to TRIO support, market and behavioral studies investigate the market potential for early-stage technologies and solutions. Ultimately, the aim of the TDS program is to communicate and collaborate with entrepreneurs and technology providers to increase the supply of EE technology solutions, including breakthrough technologies and highly disruptive innovations, to the market.

Technology Assessment (TA) Subprogram

Through the TA element of ETP, energy efficient technology solutions that are either new to the market or underutilized for a given application are evaluated for performance claims and overall effectiveness – namely cost, and end customer attractiveness – in reducing energy consumption and peak demand. Two key objectives of these assessments include 1) the adoption of new measures into PG&E's EE portfolio, and, 2) the deeming of specific technology solutions as *not* market ready. Historically, technology assessments have been a core strength of ETP and have provided critical support to EE programs. ETP assessments may utilize data and information from different sources to support assessment findings, including: in-situ testing (customer or other field sites), laboratory testing, or paper studies. In addition to other findings and/or information, assessments typically generate some − and in rare cases, all − of the data necessary for EE rebate programs to construct a work paper estimating energy and demand savings over the lifetime of the measure. Furthermore, technology solutions that are designated as 'not market ready' nonetheless intend to assist technology providers in enhancing their offerings for the EE marketplace.

Technology Introduction Support (TIS) Subprogram

The TIS subprogram supports the introduction of new technology solutions to the market, albeit on a limited scale, through several activities. Scaled Field Placement (SFP) projects are the deployment of a technology solution at multiple, participating customer sites as a key step to gain market traction and feedback. Typically, such measures have already undergone a technology assessment or similar evaluation to minimize the risk of failure. Demonstration and Showcase projects are designed to provide key stakeholders the opportunity to thoroughly vet and understand the value of proven technology solutions that advance ZNE, IDSM, and other Strategic Plan goals. The overall aim of demonstration showcases is to introduce technology solutions to stakeholders from a systems and potentially integrated level rather than an

individual (widget-based) perspective using data gathering and customer feedback in a non-simulated environment. In addition, the demonstration showcase exposes the technology solution to the broad public, investors, entrepreneurs and technology professionals, and increases market knowledge for the technology provider. Market and behavioral studies are designed to perform targeted research on customer behavior, decision making, and market behavior to gain a qualitative and quantitative understanding of customer perceptions and acceptance of new technology solutions and business models, as well as market readiness and potential for new EE measures. Finally, the Technology Resource Innovation Program (TRIP) solicits third-party projects − of up to $300,000 per project − to deploy emerging technologies on a limited scale to the market.

2016 Highlights

In 2016 PG&E and the statewide ETP program initiated 4 TIS and 1 TDS projects. PG&E also hosted the Emerging Technologies Open Forum and the Q2 Emerging Technologies Coordinating Council (ETCC) quarterly meeting. PG&E also supported the statewide IOU ETP team in the 2016 TRIO symposium on "Technology Innovation and Utility Engagement,"[7] which sought to educate investors, entrepreneurs, academia and other technology professionals on the following core elements of how to partner with utilities for bringing to market new EE technology solutions:

1. Requisite guidelines for becoming an EE technology partner with utilities
2. How to target and attract customers with EE technology
3. Highlight existing collaboration between utilities and select leading vendors via the ETCC, as a paradigm to follow

Details around PG&E's completed ETP projects are accessible via the ETCC website: http://www.etcc-ca.com. Examples of three of these projects are provided below.

Third-Party Bring Your Own Thermostat Demand Response Pilot Evaluation

Starting in the summer of 2016, PG&E partnered with three technology firms to develop the third-party bring your own thermostat (BYOT) pilot designed to leverage already installed smart thermostat technologies as a DR resource that could be ramped up in a relatively short amount of time and provide load relief to specific capacity-constrained areas on the grid. The BYOT pilot was part of PG&E's TDSM pilot and co funded by the Demand Response Emerging Technologies (DRET) program. Pilot participants were recruited by the three vendors within eight PG&E substation footprints deemed to have local capacity constraints. Customers were offered varying financial incentives by the thermostat manufacturers in exchange for allowing their thermostat to be temporarily setback on event days. This evaluation documented the program design and implementation by each of the three vendors, and provided load impact estimates across the four events that took place in 2016.

Energy Efficient Underfired Broilers

The objective of this study is to determine energy and cost savings as a result of replacing conventional broilers with best-in-class broilers in the food-service industry. The project will characterize the technological improvements that contribute to energy reductions in broilers across the market; monitor energy consumption, operating conditions, and hours of operation at least three sites; and analyze the energy and cost saving potential when standard-technology

7 http://www.etcc-ca.com/event/trio-symposium-technology-innovation-and-utility-engagement

broilers are replaced with energy-efficient broilers. This project augments a previous underfired broiler study, focusing only on lidded broilers to include other broiler technologies that can contribute to energy reductions in PG&E territory.

Smart Thermostat Study

This study sought to understand the effect of smart thermostats in residential homes within certain hot and cold climate zones in PG&E's service territory. It incorporated an estimation of the energy savings for participating households, along with an assessment of the participants' experience while taking part in the study. The Study used a randomized encouragement design (RED) approach in which several thousand homes were randomly assigned to the encouraged group, all of whom were offered a free, directly-installed smart thermostat, and two thousand similar homes were randomly assigned to a control group, none of whom were offered a thermostat. Three different brands of thermostats were tested in the study. The goal was to install 1,000 of each type of thermostat in participants' homes. A total of 2,207 thermostats were installed. The first year results included analysis of a winter heating season and a summer cooling season. All three thermostats achieved annual electric savings ranging from 4-5%. One of the thermostats tested also achieved annual gas savings.

In Q1 2017 PG&E updated the report with the results of an analysis of operational data gathered from the thermostats during the first year, such as runtime and setpoints. PG&E will also update the report in Q4 of 2017 with analysis of both energy usage and operational data gathered during the 2nd year, and additionally the results of a customer survey that will be performed in the same period.

Workforce, Education & Training

As part of meeting its ambitious EE targets, California recognizes the need for a well-trained workforce that has the knowledge to recognize energy efficiency opportunities and the skills to act on those opportunities. WE&T provides professionals who design, build, and operate buildings the relevant skills needed to help eliminate unnecessary energy use in buildings.

PG&E's WE&T Program staff continued to demonstrate leadership in the local, state, and national EE workforce arenas in 2016. While administering three WE&T subprograms—Planning, Centergies, and Connections—PG&E's WE&T team also provided technical advice to local workforce development organizations, post-secondary educational institutions, and trades' training programs. WE&T staff also presented at regional and national workforce development and technical conferences, and serve as technical EE advisors to PG&E's other DSM programs and to external industry groups.

PG&E Promotes Teacher and Student Energy Awareness for 26 Years

The Energenius program has provided pre-K through 8 teachers and students educational materials for 26 years. In 2016, we reached over 98,500 students at 819 schools. PG&E also released an enhanced 5th-6th grade program, Power Down for the Environment that focuses on energy-efficient habits and includes activities for students to do at school and at home.

2016 Key Initiative

ZNE Home Exhibit, Stockton

In 2016, WE&T staff led the effort to complete the design and construction of the ZNE Display House exhibit at the Stockton Energy Training Center (ETC). PG&E launched the ZNE Display House in March 2016. The exhibit provides visitors the opportunity to learn about the concepts and how-to's of ZNE residential design and construction strategies. The display features state-of-the-art building systems and technologies that contribute to creating a ZNE home, provided via a self-guided iPad-based interactive learning experience. Over the past year, hundreds of visitors have experienced the self-guided tours, and staff has provided over 50 tours to diverse groups, including K-12 schools, trade groups, policymakers, and community leaders.

Strategies and Successes

2016 was a year of delivering energy efficiency WE&T programs, educational materials, technical advice, community outreach, and tools from our lending library to a diverse set of building professionals who have the potential to design, build, and maintain in ways that will save energy in the short and long term. WE&T engaged in program redesign based on market needs and expanded stakeholder engagement, setting a foundation that will support the future energy efficiency workforce demands and WE&T Program direction. Details around those strategies and successes are included in the WE&T subprograms sections.

Opportunities Moving Forward

A significant opportunity for the WE&T program includes moving from outputs-based metrics to outcomes-based metrics. Historically, WE&T has had goals and metrics that were transactional and "counting of widgets" (outputs)—numbers of classes, numbers of tool loan transactions, etc. Outcomes-based metrics will communicate a better story to our customers, and to the Commission and other stakeholders about what resulted from those outputs. PG&E led the effort to get statewide agreement on the following three outcomes-based metrics—knowledge gain, changes to workplace practice (course participants using what they learned in the classroom as part of their jobs), and transforming other training organizations' training programs with IOU-provided resources and materials. Statewide agreement on these outcomes-based metrics is an important step on the path toward capturing WE&T's long-term outcomes, such as energy savings, which cannot be measured with traditional output metrics. More information about outcomes-based metrics are included in the WE&T Planning subprogram section.

WE&T Subprograms

WE&T Planning

WE&T Planning develops the framework for planning, coordinating, and implementing WE&T activities, partnerships, and recommendations to meet WE&T goals. WE&T Planning also makes program modifications to evaluate and incorporate market and stakeholder demand.

2016 Strategies and Successes

In 2016, PG&E led the statewide collaboration effort between the IOUs and the Southwest Carpenters Training Fund (SWCTF)—a union workforce training organization for carpenter apprentices and journeymen. This two-day train-the-trainer course expanded PG&E's reach, developing our partnership with trade organizations and assisting another organization in enhancing the EE content of their programs. The course showed carpenter trainers how to use a blower door so apprentices and journeymen have a better understanding of a tight building envelope and how to test the structures they build for air leakage. The train-the-trainer course also showed carpenter trainers how to use an infrared camera, which would be used for detecting air leakage spots in the building envelopes that carpenters construct.

As a step toward moving the WE&T Program from output-based metrics (e.g., number of classes), PG&E's WE&T team researched how comparable training organizations across the U.S. developed their metrics. The research included a literature review of other organization's efforts, how they capture changes to workplace practice, and how they may have influenced other trainer organizations programs. The report is being finalized and will be completed in 2017, providing lessons learned and illustrating a common theme: that outcomes-based metrics require changes to program operations and upfront agreements with partnering organizations.

In 2016, PG&E also developed first-source language that could be used in EE programs' contracts with implementers. The inclusion of first-source language in contracts was one of the recommendations from the Don Vial Center Guidance Plan. More important than fulfilling a recommendation, first source efforts also support a subset of our customers who may come from low-income communities and who may have recently become unemployed. The first source language that PG&E is now using in its 2017 ESA contracts asks vendors to notify local workforce development agencies if they need to fill positions to complete the work specified in the contract.

WE&T Centergies

PG&E's WE&T Centergies subprogram consists of three Energy Centers—the Pacific Energy Center (PEC) in San Francisco, the ETC in Stockton, and the Food Service Technology Center (FSTC) in San Ramon. These energy centers target the EE workforce in several market segments, including agriculture, foodservice, commercial, industrial, SMBs, and residential. Centergies provides in-person and web-based education and training programs, technical advice, research assistance, outreach events, and building performance tool loans. The classes offered through the energy centers received student satisfaction ratings of over 98%, and the Tool Lending Library (TLL) received over 99% customer satisfaction ratings.

2016 Strategies and Successes

In addition to completing the ZNE House, WE&T staff also led the effort to complete the buildout of the Stockton ETC, which opened its doors in early 2016. Part of the buildout included new and upgraded facilities to better serve contractors and technicians who serve PG&E customers. The updated Blower Door House will be used for blower door testing, air sealing, air leakage diagnostics, advanced framing demonstration, building insulation demonstration, and thermal and infrared testing. The HVAC Labs include state of the art installation, testing and diagnostics stations with side-by-side comparisons of technologies, system types, and installation types, all with hands on training and testing for real world applications.

For 2016, the TLL provided tools for 723 loans for 635 distinct projects. Approximately one third of projects were associated with PG&E incentive programs. Similar to previous years, a majority of the loans (515) were Commercial Power and Energy projects. One notable TLL supported resource program initiative, the ALCS measurement and verification (M&V) Energy Savings Estimation Tool program, is a year-long study we began in October 2016. TLL staff also oversaw the completion of the TLL office redesign and relocation. The move addressed ergonomic issues as well as operational efficiency. Furthermore, TLL staff engaged myTurn, a cloud-based inventory management software provider, to redesign and host the aging Microsoft Access-based TLL inventory tracking system which will go live in 2017. It will result in more efficient operations and the ability to expand operations more easily in the future should our business plans head in that direction.

WE&T Connections

The Connections subprogram provides teaching resources for K-12 and college instructors as well as EE and green career awareness and exploration programs for K-12 and college students. PG&E's WE&T Connections subprogram includes Energenius (pre K-8), PEAK (K-8), Green 360 (7-12), Energize Schools (9-12), and Energize Colleges (postsecondary).

The Statewide Connections team issued and awarded three statewide Requests for Proposals (RFPs) for K-8, high school, and post-secondary audiences in 2015 and began implementation in 2016. To move the postsecondary programs toward being self-sustaining, a financial commitment is now required from the participating colleges. This will release funding for more campuses to participate in the future.

2016 Strategies and Successes

In 2016, PG&E enhanced and updated curriculum materials in all Connections programs and improved Energenius' energy efficiency and student habits activities in the new 5th-6th grade "Power Down for the Environment" program. We also introduced PEAK Student Energy Actions 3-D classroom activities to students in grades 3-5 via a partnership with the Smithsonian Science Education Center, and launched the Energize Schools' solar certificate program. The

solar certificate program is currently being piloted with several statewide John Muir Schools which provide work-based continuation high school programs. Connections materials integrate energy efficiency, demand response, distributed generation, and green career awareness and correlate with California's Common Core State Standards. They also incorporate Next Generation Science Standards.

Green 360 provides career planning resources to identify EE and green career pathways. In 2016, Green 360's audience was made up of middle schools, high schools, and colleges. Its audience also included community-based organizations, such as Soar for Youth, a community-based organization serving foster youth in the San Francisco Bay Area which now uses PG&E's Green 360 Career Catalyst resource as an integral component to their Summer Camp Program at UC Berkeley. One key accomplishment was integration of new activities and lesson plans for educators supporting classroom implementation of Career Catalyst experiences.

The Statewide Energize Colleges program launched in March 2016 and spent significant effort obtaining college campus faculty and facility staff to agree, and sign off, to program efforts that require campus resources, including financial commitments from the campuses. However, given this challenge, Energize Colleges gained commitment from ten campuses, hired ten Fellows and eighteen interns across Community College and UC/CSU campuses in the four IOU territories. Five Fellows and seven interns hired are serving colleges within PG&E territory. Through the program, fellows and interns collaborated with college professors to incorporate energy efficiency, demand response, and distributed generation concepts into new and existing courses and to initiate seven campus and community projects.

Integrated Demand Side Management

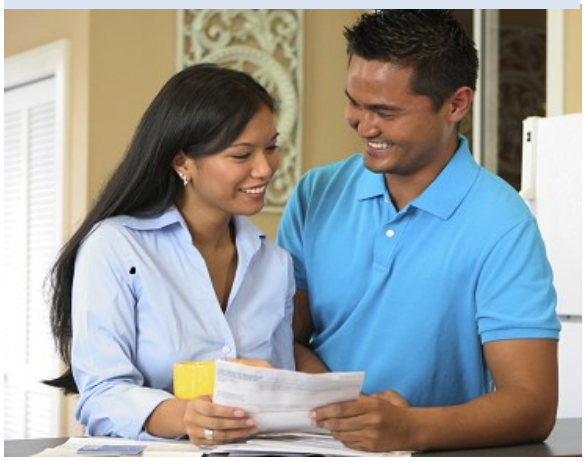
The Strategic Plan recognizes the integration of DSM options, including EE, DR, and DG, as fundamental to achieving California's strategic energy goals. To support this initiative, the IOUs have identified IDSM as an important strategic DSM policy priority and have proposed a series of activities, pilots and other programs in response to the Strategic Plan DSM Coordination and Integration Strategy.

The statewide IDSM program focuses on the following initiatives:

1) Development of a proposed method to measure cost-effectiveness for integrated projects and programs including quantification and attribution methods that includes GHG and water reductions benefits and the potential long-term economic and electric/gas hedging benefits.
2) Development of proposed measurement and evaluation protocols for IDSM programs and projects.
3) Review IDSM-enabling emerging technologies for potential inclusion in integrated programs.
4) Development of cross-utility standardized integrated audit tools using PG&E's developed audits as a starting point.
5) Track integration pilot programs to estimate energy savings and lessons learned and develop standard integration best practices that can be applied to all IOU programs based on pilot program evaluations and the results of additional integration promoting activities (i.e., EM&V and cost-benefit results).
6) Develop regular reports on progress and recommendations to the CPUC.
7) Organize and oversee internal utility IDSM strategies by establishing internal Integration Teams with staff from EE, DR, DG, marketing, and delivery channels.
8) Provide feedback and recommendations for the utilities' integrated marketing campaigns including how the working group will ensure that demand response marketing programs approved as Category 9 programs are coordinated with EE integrated marketing efforts.

Achieving IDSM Objectives

PG&E continues to work towards **taking a holistic approach to customers' needs** when offering potential solutions to customers. Collaboration is a focus amongst many different internal departments including energy efficiency, demand response, rates, customer support, emerging technology, electric vehicles, net metering, energy assistance and others to develop the offer the right solutions, to the right customer, at the right time. PG&E continues to emphasize the importance of this approach throughout the organization.



2016 Strategies and Successes

Statewide IDSM

The IOUs have developed well established processes ensuring delivery of integrated messaging via marketing, education and outreach to residential and business customers. Delivery of IDSM marketing has become more than just promotion of multiple programs within specific tactics like collateral or websites. It is now a key component in the planning phases of integrated marketing, education and outreach to help provide the right solutions to the right customer, at the right time.

Throughout 2016, the statewide Online Integrated Audits team delivered a consistent online integrated audit tool that works with each IOU interface and educates customers on managing their energy use costs.

Additionally, the Onsite Integrated Audits team continues to collaborate to share approaches and best practices and to discuss ongoing collaboration. The IOUs continue to offer onsite integrated audits to small, medium and large customers.

PG&E's IDSM Efforts

PG&E's 2016 IDSM efforts focused on providing thorough training to staff regarding IDSM objectives. The cornerstone of the training program was to host our annual IDSM summit in March 2016 to increase knowledge and awareness on integrated approaches, meet regulatory compliance directives and to promote communication between all divisions and departments. Account representatives and select program advisors were also encouraged to emphasize customer segmentation in their approaches.

PG&E also developed integrated marketing campaigns and collateral continued throughout the year for business and for residential / smaller business customers. Furthermore, PG&E's Marketplace continued to expand for customers to quickly and easily shop for energy saving products and services offered by third-party retailers. It is designed to help users save money through an easy-to-use tool that will help generate greater energy awareness, education and empowerment for customers to take action.

The Water Energy Nexus working group, in collaboration with Commission staff, continued efforts to determine the best way to proceed in use of the embedded energy calculator. Plans to identify both custom and deemed embedded energy measures will be more thoroughly explored in 2017.

From an IDSM technology perspective, PG&E continued to provide demand response enabled programmable communicating thermostats to both residential and commercial customers. Additionally, the ETP team reviewed a number of projects. One that continued its importance in 2016 is the ZNE Builder Demonstration Project. To move motivated production builders toward the state's ZNE goals and help them to get ahead of the curve, PG&E is running a ZNE Production Builder Demonstration project. The overall goal is to help production builders develop a new ZNE prototype or upgrade one of their existing prototypes to ZNE by providing support from start to finish. This includes design support, construction inspections, incremental cost assistance, and performance monitoring of the completed home.

Financing Program

PG&E's EE Financing program is designed to help customers finance the up-front cost of EE projects. The statewide Financing program is offered in conjunction with other PG&E EE programs to stimulate and enable higher levels of customer participation.

2016 Key Initiatives

On-Bill Financing Program Improvements
During 2016, PG&E implemented a new option for project qualification for OBF. The new process affords project developers and customers more flexibility in how they implement their project. This flexibility allows customers to get measures tailored to their needs and drive the process and timeline themselves. PG&E expects this new process to drive greater participation and deeper energy savings as it becomes more widely adopted in 2017.

PG&E's Finance team continues to focus on delivery of the OBF program to ensure that the program meets the needs of our internal and external partners, as well as our customers. The program continued its growth and now has fully cycled through its initial funding allocation.

PG&E's OBF Program Continues Growth in 2016

In 2016, PG&E maintained the success of the OBF program while making significant investments to improve processing time and scalability for the future.

OBF delivered 398 loans across the agricultural, commercial, institutional, industrial and multifamily sectors in 2016, 8% over the 367 loans extended in 2015.

Financing Pilots
Throughout 2016, PG&E and the statewide Financing team worked closely with Commission Staff, the California Alternative Energy and Advanced Transportation Financing Authority (CAEATFA), and the Center for Sustainable Energy on the development of the Statewide Finance Pilots.

Financing Website
PG&E maintains an internet site (www.pge.com/eef) that directs customers to potential financing options, including OBF. The site includes a video describing the financing process as well as a case study that illustrates how financing can unlock EE potential. PG&E also maintains an intranet page to share resources and best practices for financing projects with internal staff along with hosting resources for PG&E representatives and trade professionals.

Strategies and Successes

PG&E's EE financing programs facilitate portfolio energy savings by allowing customers to pursue large, comprehensive efficiency retrofit projects that might not have been financially feasible otherwise. In 2016, the OBF Program maintained its strong growth in financed projects, totaling 477 loans issued for $19.5 million. PG&E has also continued collaborative efforts with the Statewide IOUs and CAEATFA, to develop financing pilots that will offer more flexible terms to a broader array of customers.

PG&E's EE Financing programs allows customers to pay for their EE projects as they save money on their energy bill. Doing so allows them to undertake more comprehensive projects and, in some cases, projects that would not have been feasible without financing.

Opportunities Moving Forward

For the OBF Program in 2017, PG&E will continue to seek operational efficiencies with our web-based application system, thereby increasing the speed of project implementation and payment. This in turn will enhance OBF's value as a tool for increasing investment in EE, and the realization of related savings, across the PG&E service territory. Faster project implementation will drive increased customer interest and uptake from channel partners.

PG&E will seek widespread adoption of the new option for qualifying projects for OBF that will not require participation in a rebate or incentive. This will open financing to projects that do not fit into standard measure-based programs, expanding opportunities for customers and contractors. It will also allow for quicker processing and payment of OBF loans.

Financing Subprograms

On-Bill Financing

OBF is a key enabler of energy savings across customer classes, providing 0 percent financing for qualifying EE retrofits, with loan payments appearing as fixed monthly charges on the customer's PG&E bill. OBF helps customers, who would otherwise have difficulty qualifying for or using commercial credit, get over the first-cost hurdle to EE investment, unlocking broader and deeper cost savings while supporting PG&E's energy savings targets.

OBF Bridges the Finance Gap for PG&E's SMB Customers and Delivers Significant Savings

SMB customer segment saw particularly strong growth, with the **number of new SMB loans increasing 15 percent**.

2016 Strategies and Successes

The OBF Program issued more than $15 million in new loans to 398 customers. Overall, OBF saw an 8% increase in total loan volume and a 17% increase in SMB loans. PG&E's marketing team created new case studies and marketing materials which led to a strong increase in new applications, particularly from the SMB segment. .

Financing Pilot Programs

The IOUs are developing a set of statewide Financing Pilot programs designed to encourage private lenders to offer financing products specifically for EE projects by offering both credit enhancements in the form of loan loss reserves, and the option of loan collection by the utility on behalf of the lender (On-Bill Repayment or OBR).

The statewide pilots consist of the following on-bill repayment programs:

- Small Business OBR Loan Program
- Small Business OBR Lease Program
- Non Residential OBR without Credit Enhancements (CE) Program
- Master-Metered Multi-Family OBR Program

In addition, PG&E is in the process of launching the Energy Finance Line Item Charge Program, a residential On-Bill Repayment program to be offered in PG&E's service territory.

The Financing Pilots also include two off-bill programs:

- Single Family Loan Program (renamed the Residential Energy Efficiency Loan Assistance or REEL Assistance Program)
- Off-Bill Small Business Lease Providers Program

The pilots include ratepayer-supported credit enhancements (CE) for residential properties and small businesses. The CEs are expected to provide additional security to third party lenders and private capital so they can extend or improve credit terms for EE projects.

2016 Strategies and Successes

The Financing Pilots will be administered by CAEATFA. These Pilots were expected to launch in 2013. However, the Pilots were delayed pending approval of CAEATFA's request for state legislative budget authority to act as the California Hub for Energy Efficiency Financing. CAEATFA received budget authority in July 2014. On August 25, 2014, the CPUC issued an Assigned Commissioner Ruling that ordered each finance pilot to operate for a minimum of 24 months, beginning at the point that each pilot program begins operation. The first regular track programs (off-bill programs) launched in the second quarter of 2016. The OBR and EFLIC programs are scheduled to launch once the statewide loan servicing function has been implemented.

Third Party Financing

PG&E funded two American Recovery and Reinvestment Act (ARRA) continuation programs. The emPower SBC Program is administered by the County of Santa Barbara and is a joint co-funding effort between PG&E, Southern California Edison Company (SCE) and Southern California Gas Company (SoCalGas). The program leverages ARRA funding to create a public-private partnership between the County, all eight incorporated cities, the Home Upgrade Program, and two local credit unions.

The Golden State Finance Authority Loan product uses a loan loss reserve to make financing available specifically for EE projects. The loans are available across the PG&E territory and can provide up to $50,000 of funding to customers at affordable rates. The program is important as it provides an option for customers looking to perform whole house retrofits under the Home Upgrade Program.

Water Energy Nexus

Customers across all segments are acutely aware of water constraints in California. 19% of statewide electricity (kWh) is associated with water consumption including long haul transport of water, the supply and treatment of water and wastewater, groundwater pumping and end-use water heating and pressurizing. Approximately 5% of statewide electricity use (or 12,754 GWh) is used for treating and moving water and wastewater.[8] When a customer saves water on their site, it reduces the energy used to provide that water to the customer, i.e., the embedded energy. PG&E's EE programs aim to assist customers and partners in achieving their broad conservation goals where both water and energy typically go hand in hand.

Throughout 2016, PG&E continued its success in water energy efficiency by offering customers a number of options to reduce their water use, including energy efficiency rebates for high-efficiency appliances, such as clothes washers and shower heads. We also offered incentives to commercial customers, including equipment such as ice machines, combination steam cookers and pre-rinse spray valves. Agricultural customers received incentives for converting from sprinkler systems to water-efficient drip irrigation, as well as programs for energy efficient pumping systems and more.

PG&E's Water Savings

Altogether, customers who participated in PG&E's programs reduced water usage by about 800 million gallons in 2016, based on an analysis of our most common energy efficiency measures that deliver water savings. This was down from the 1.2 billion gallons of water saved in 2015, with the decrease linked to programs to help customers convert their sprinkler systems to drip irrigation alternatives and fewer refrigeration upgrades in the dairies and wineries program.

Key Initiatives

In 2016, PG&E collaborated closely with the CPUC to begin integrating the Water Energy Cost Effectiveness Calculator (Water Energy Calculator) into energy efficiency offerings. The Water Energy Calculator, originally developed by the CPUC, calculates the energy used to produce, deliver and dispose of potable water. It allows PG&E to capture energy savings above and beyond site-specific energy savings from measures like low flow showerheads or clothes washers. Efforts in 2016 focused on identifying and implementing steps to integrate the Water Energy Calculator into current energy efficiency program operations. The steps included defining the first set of prescriptive measures to use the calculator as well as the right non-residential markets to target customize services.

While operational needs were explored, PG&E launched another pilot to further our understanding of opportunities for electric utilities and water agencies to collaborate. This pilot

[8] California's Water Energy Relationship; Prepared in Support of the 2005 Integrated Energy Policy Report Proceeding (04-IEPR-01E). CPUC. 2005.

focused on the use of Advanced Metering Infrastructure (AMI) to deliver water savings data. This pilot measures the value of communicating AMI dependent data (i.e., information collected and conveyed at an hourly temporal resolution at a minimum) to consumers in terms of household water, electricity, and gas consumption. The project will provide information on how behavior based messaging affects both energy and water savings in the residential sector. This pilot is expected to be completed in 2019.

PG&E also initiated a market assessment to evaluate how management of agricultural energy and water use can be improved with access to improved data. The assessment is expected to be completed in 2017. As part of the assessment, types of information that can assist in improving farmers' management of energy and water and specific software and hardware available to customers were identified. The project also investigates: current approaches to irrigation scheduling and operations, emerging tools and best practices, barriers to adoption and how information leads to problem awareness and action.

Strategies and Successes

PG&E's strategy for integrating the Water-Energy Nexus paradigm into our portfolio is multi-faceted. PG&E approached each sector differently to address the specific needs and barriers of that sector. Water conservation and the state's 25% reduction goal were still top of mind for our residential customers. PG&E responded by offering Simple Savings Kits, which provided low cost ways to save energy and water in the home. They included 2 LED lamps, 2 faucet aerators, 1 low-flow showerhead with a thermostatic control valve, a "toilet tummy" and leak detection tablets. The kits were sold to customers for $10, a significant discount from the $70 retail value. Each kit was estimated to have saved the equivalent of 225 showers a year. With the close of the program in July, PG&E sold about 23,000 kits. PG&E also offers water-saving tips and strategies to residential customers through its website.

For Agricultural customers, PG&E continued providing rebates for sprinkler to drip irrigation which increases the efficiency of the customer's water application and reduces waste. Additionally, the APEP, a joint service provided by PG&E and the California State University, Fresno, continued to offer an educational and incentive program to improve overall agricultural pumping efficiency and encourage energy conservation.

In addition to working with the water end users, PG&E also continued its successful programs specializing in helping water agencies and public water districts improve energy efficiency. For more information on our targeted Third Party programs, see the Third Party Industrial Program section.

Implementation Challenges

Integrating the Water Energy Calculator into PG&E's energy efficiency offerings has faced various challenges including agreement on the right reporting structure, proper definition of IT system updates, and general discussions on program design guidelines. PG&E was able to work with key stakeholders to address most questions but long term considerations need to be made about where savings attribution for Water-Energy projects will live.

Collaboration between water utilities and energy utilities in standing up new offerings and finding new avenues to deliver savings will be critical as the Water Energy Calculator becomes better understood. However, water utilities and energy utilities face differing incentives, savings reporting methodologies, and organizational challenges. Reconciling these differences will be a significant challenge over the coming years.

Opportunities Moving Forward

Standing up new offerings that incorporate embedded energy savings from water conservation will be an important step as the Water Energy Calculator moves closer to operationalization. Maximizing the impact of the calculator will require close collaboration with water utilities, and incorporating the needs of these partners when designing and delivering new programs and sub-programs.

Beyond the Water Energy Calculator, PG&E will continue to offer water-saving opportunities for key segments that would maximize our impact on water-energy usage including the Agricultural sector and water and wastewater districts.

Descriptions and Strategies – Local Programs

Covering 70,000 square miles in Northern and Central California, and serving 15 million people, or 5 percent of the U.S. population, PG&E's territory and customers are very diverse. Over 80 languages are spoken throughout PG&E's territory, covering very rural to urban communities, with a diverse residential, commercial, agricultural and industrial base. To serve this diverse group of customers, PG&E leverages local partnerships and third party programs to serve targeted and niche markets, harder-to-reach segments and to focus customer groups with specific needs. This section describes PG&E's 2016 strategies and accomplishments for the following local programs:

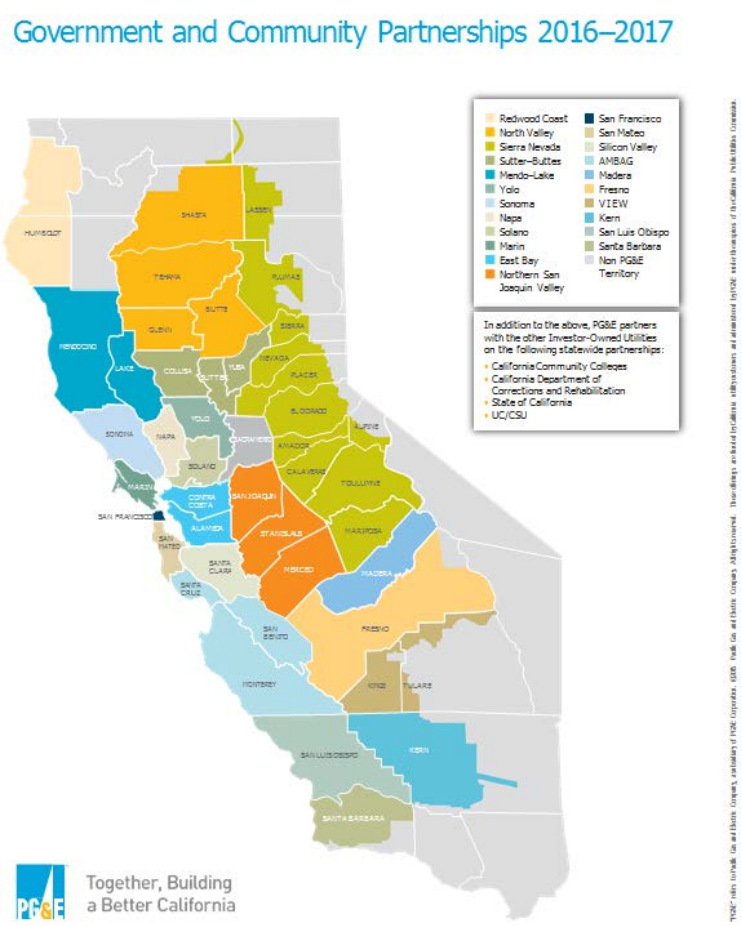
Government and Community Partnerships

- Institutional Partnerships
- Local Government Partnerships

Third Party Programs

- Residential Sector
- Commercial Sector
- Industrial Sector
- Agricultural Sector

Government and Community Partnerships



PG&E's Government and Community Partnerships (GCP) are collaborations with public entities that shape EE and sustainability at the local, regional, and statewide level. These partnerships aim to meet the needs of local and state government, and schools and educational institutions to offer comprehensive solutions that are flexible, innovative, and a reflection of the communities' needs.

PG&E's GCP team administers 22 Local Government Partnerships (LGPs), as well as four Institutional Statewide Partnerships with California Community Colleges, University of California/California State University (UC/CSU), the State of California, and the California Department of Corrections and Rehabilitation. The GCP team also supports K-12 public schools and offers limited energy planning services for public entities interested in benchmarking their facilities and pursuing local energy reach codes and ordinances. In addition, GCP offer a robust LED streetlights offering for public sector customers.

LGPs are PG&E's primary vehicle for serving commercial SMB as these customers are frequently made aware of PG&E's offerings as a result of the outreach conducted by the Energy Watch programs. Learn more about Energy Watch programs in the LGP section.

Key Initiatives

In 2016, GCP implemented significant enhancements to its suite of nine Regional Direct Install Programs. These distinct programs were brought under a consistent set of program policies and guidelines, including the alignment of incentives across each program. A new incentive offering for Hard-to-Reach customers was launched to help ensure under-served small businesses, non-profits and local governments continue to participate in these comprehensive programs.

PG&E also migrated these programs into Energy Insight– a cloud-based customer relationship management, project tracking, and collaboration platform. Energy Insight is designed to more efficiently track energy efficiency projects, automate processes, and keep Program Managers abreast of project and program updates, offerings, strategies, and policies.

To improve the effectiveness of program outreach and customer acquisition efforts, GCP began to leverage data analytics to develop lists of high potential customers and utilize these lists to target customers with Regional Direct Install programs and other PG&E offerings.

In addition, GCP play an active role in supporting the TDSM Initiative, a multi-year campaign focused on leveraging existing demand-side programs, including EE, to reduce peak load on specific substations leading to deferral or reduction in distribution capital spending. Given the geographically focused nature of GCP-led Regional Direct Install programs, GCP significantly contributed to this initiative's goal achievement.

Also in 2016, GCP continued laying groundwork for program innovation and driving cost-effectiveness by engaging Partners through the scoping and drafting of the 2018-2025 Business Plan. PG&E's GCP team engaged Partners on multiple levels and actively sought their input on the development of the Business Plan, including the addition of a new Public Sector Chapter.

PG&E partnerships also continued their leadership with local government climate action and GHG planning. Since 2010, PG&E's partners have produced over 250 GHG inventories and over 75 energy/climate action plans.

2016 Strategies and Successes

Government and Community Partnerships are focused on delivering energy savings by bringing innovative strategies to customers that encounter unique barriers to adopting energy efficiency measures compared to those of larger and well-resourced commercial facilities.

Through Energy Watch partnerships, SMB customers are served by the Regional Direct Install Program model. Partnership-implemented Regional Direct Install programs deliver over half of the SMB energy savings achieved by PG&E's downstream energy efficiency portfolio. Underserved small and medium commercial customers typically need additional support in designing and managing energy efficiency projects. In response, the Direct Install model provides participants with a turnkey program offering, project scoping and audits, technical assistance and financial incentives to enable these customers to pursue energy efficiency.

The LED Streetlights program offers public agencies a turnkey approach to switching out inefficient high-pressure sodium-vapor bulbs with new LED lamps. In 2016, PG&E completed streetlight upgrades across nine partnership areas, ranging from the City of Grass Valley (part of the Sierra Nevada Energy Watch) to a comprehensive multi-year project for the City of San Jose (part of the Silicon Valley Energy Watch). Participating cities saved a total of 3,096,106 kWh.

The Moderate Income Direct Install (MIDI) program is a residential energy efficiency program which offers no cost installation of prescriptive energy efficiency measures, home energy audits, and customer education. Funded through PG&E's GCP, MIDI operates in coordination with local partners by targeting customers who are just above the low income threshold for PG&E's Energy Savings Assistance program and need assistance with implementing energy efficiency improvements. In 2016, the MIDI program served over 2,000 homes.

In support of Proposition 39 - the California Clean Energy Jobs Act, PG&E continues to work closely with eligible local educational agencies to support adoption of innovative energy efficiency projects. PG&E launched a Prop 39 ZNE Schools Pilot to assist schools in retrofitting existing facilities to ZNE by leveraging Prop 39 funding. The Pilot is establishing a proof of concept that ZNE retrofits of schools is feasible across California. PG&E is moving forward with

seven pilot projects across its service territory and examining the feasibility of a larger-scale program for future years.

In 2016, PG&E launched a customer relationship and incentive-processing platform called Energy Insight for GCP programs. Energy Insight enables Regional Direct Install implementers more flexibility when developing energy efficiency proposals for customers and provides Partners with better access to data so that they can better engage their local community.

Implementation Challenges

Past evaluation, measurement and verification studies have been limited to local government programs. GCP's approach could be better supported by evaluation data that focuses on schools and state agencies.

To align with CPUC direction and the other IOUs, PG&E discontinued its monitoring-based commissioning (MBCx) program which was a major driver of savings for Institutional Partnerships. In support of a providing a replacement program to institutional customers, PG&E is incorporating lessons learned from the MBCx program into the new Commercial Whole Building program which is under development and will be designed to served higher education and state government customers.

Institutional Partnerships Subprograms

Institutional Partnerships, designed in partnership with the four IOUs, serve agencies of the state of California and state educational institutions. The objective of Institutional Partnerships is to reduce energy usage through facility and equipment improvements and share best practices among state institutions. There were four Institutional partnerships in 2016.

Through these Partnerships, IOUs and partners encourage strategies that promote investment in energy efficiency through comprehensive resource support and internal capacity-building. Although these existing Partnerships have made progress over the years, significant energy savings opportunities exist within state government and higher educational facilities. For example, with California's Executive Order B-18-12 requiring reductions in grid-based electricity purchases (20% by 2018) and aggressive ZNE goals (50% of all new and existing facilities by 2020 and 2025 respectively), the State is well positioned to make significant progress towards reducing energy usage and the overall carbon footprint of its facilities and infrastructure.

PG&E's Institutional Partnership portfolio focused on achieving energy savings and supporting DSM integration and coordination, which includes improving regulatory coordination, establishing integration procedures, and piloting DSM integration programs.

Highlights of Institutional Partnerships 2016 Strategies and Successes

- Continued support services for **Proposition 39** funding to California Community Colleges includes enhanced outreach, project development and technical support for 72 districts containing 112 campuses throughout California.
- Completed more than **80 Retrofit**, Monitoring Based Commissioning, and New Construction projects at **23 different UC and CSU campuses** (inclusive of UC Medical Centers) across the Partnership for 2016.
- The **CDCR Partnership** completed 6 minor major projects and filled its 2017 project pipeline.

California Community Colleges (CCC)

The California Community Colleges/Investor-Owned Utility (CCC/IOU) Energy Efficiency Partnership advocates, promotes and supports energy efficiency in the California Community College system by leveraging resources from the Community College Districts, the Community College Chancellors Office, the four IOUs, and the State of California. This unique Partnership results in achieving common goals for energy use reduction, cost savings, and fostering a more sustainable future.

The CCC/IOU Partnership provided extensive outreach and support services to the districts within the California Community College system in support of their efforts to identify, develop, and implement projects funded through Proposition 39.

2016 Strategies and Successes

The CCC/IOU Partnership's support of the California Clean Energy Jobs Act (Prop 39) program began in early-2013 and includes hands-on services from the four IOUs involved. Prop 39 was approved by California voters in 2012 and, among meeting objectives related to tax reform, will generate a projected $550 million annually for appropriation by the Legislature for eligible projects to improve EE and expand clean energy generation in schools (K-12). These services include funding enhanced outreach, project development and technical support for 72 districts containing 112 campuses throughout California. Specific support tasks for Prop 39 include:

- Education about the CCC/IOU Partnership and Prop 39 program opportunities
- Identification of projects and development of a "Call for Projects Lists" for submission to the Chancellor's Office including rough order of magnitude of cost and savings estimates
- Creation of energy savings calculations which work for both IOU incentive programs and Prop 39 applications
- Technical verification of energy savings calculations through the IOU incentive applications processes
- Detailed creation of both IOU Incentive and Prop 39 applications and supporting calculations
- Coordination between CCC/IOU Partnership and Prop 39 program
- Support for project status tracking and reporting

To date, these efforts have resulted in the identification and funding across the State of over 600 Prop 39 projects. Further, this support has enabled full Prop 39 program participation from all 72 districts, helping to ensure the success of this important statewide initiative.
The program continued outreach efforts through participation in the CCC IOU Partnership Management team, and via PG&E participation in various workshops and conference presentations directed toward campus facilities staff.

In 2016 the program focused on meeting campus and IOU annual energy savings goals for 2016 project completion and achievement. In PG&E territory, the program made the most savings impact in lighting, completing 19 projects resulting in 686,741 kWh saved. The program also completed 6 Whole Building (MBCx) projects in 2016, resulting in savings of 173,536 kWh and 21,551 therms.

The program supported ten Fellows as part of Strategic Energy Innovation's Bay Area Climate Corp program. These fellows were placed at campuses across PG&E territory to provide support for energy projects and other sustainability efforts.

University of California and California State Universities (UC/CSU)

The UC/CSU and IOU Energy Efficiency Partnership is a unique, statewide program to achieve immediate and long-term energy savings and peak demand reduction within California's higher education system. In 2016, this partnership continued the permanent framework established in previous program cycles for sustainable, comprehensive energy management at campuses served by the IOUs.

The UC/CSU program attributes its success in part to an engaged management team and executive team that meets regularly to discuss overall program status and policy issues. The Partnership also has a Training and Education Team that organizes various EE trainings targeted to university campuses. In addition to representatives from each IOU, the University of California Office of the President and California State University Chancellor's Office each have members on all three program management teams. Inclusion of all Partnership stakeholders at the various management levels provides the UC and CSU campuses with support in their efforts to implement energy efficiency projects. The Program Administrator actively tracks project savings and schedule data in a web-based tracking tool and creates regular reports to show overall status of the program and forecasts relative to goals.

Members of the management team also meet on a regular basis to document implementation progress, identify and resolve issues, and drive project completion. The Program Administrator actively tracks project savings and schedule data in an online tracking tool, and creates regular reports to show overall status of program or forecasts relative to goals.

2016 Strategies and Successes

A major emphasis was placed on meeting campus and IOU annual energy savings goals in 2016 through MBCx and New Construction projects, which resulted in nearly 6 million kWh saved at 23 campuses across the Partnership.

The Partnership continued to actively engage the California State University Chancellor's Special Repairs funding initiative.to help identify and fund new projects. Additionally, the Partnership continued to support training education and outreach efforts by holding various workshops for campus faculty and staff members.

State of California Partnership

The State of California Energy Efficiency Partnership Program shares best practices and implements energy efficiency projects for immediate and long-term energy savings and peak demand reduction at state-owned facilities served by the IOUs and other partners.

The partnership assists state agencies, under the Executive Branch of the state government, to comply with Executive Order S-20-04 (Green Building Initiative). The partnership also assists the Judicial Council of California (JCC), the administrative division of the Judicial Branch, to achieve their energy efficiency goals. These efforts help reduce the amount of energy the state purchases off the electrical grid. This statewide partnership provides enhanced custom incentives and core programs for projects implemented in California's state owned and leased buildings. Additionally, the IOUs provide services for education and training activities. An objective of the partnership is to integrate and coordinate various utility programs to leverage incentives and encourage customers to expand their focus beyond energy efficiency.

Partnership activities achieve cost-effective energy savings through energy efficiency, retro-commissioning, equipment retrofits, new construction, Third Party programs, DR programs, and

any applicable self-generation programs. The partnership also seeks opportunities to integrate utility incentives with financing options. These include state financing through the GS $mart Program, the ARRA Revolving Loan Fund, or PG&E's OBF program to increase program participation in the partnership effort and encourage additional energy projects.

2016 Strategies and Successes

The Partnership acquired a Program Administrative Manager (PAM) to assist with program implementation. The Partnership also participates in and provides education and training material at monthly Sustainable Building Working Group (SWBG) meetings. The SWBG is a collaborative effort between State of California agencies, focused on identifying and scaling sustainable practices, including energy efficiency. In addition, the partnership met frequently throughout the year. In addition to monthly management team meetings and quarterly executive team meetings, the Partnership instituted monthly project status meetings for both Executive Branch and JCC projects to ensure the Partnership deploys resources in a timely and effective manner.

California Department of Corrections and Rehabilitation

The California Department of Corrections and Rehabilitation (CDCR) partnership is a statewide energy efficiency Partnership Program that accomplishes immediate long-term peak energy demand savings and establishes a permanent framework for sustainable, long-term comprehensive energy management programs at CDCR institutions served by California's four IOUs. This Partnership capitalizes on the vast opportunities for efficiency improvements and utilizes the resources and expertise of CDCR and IOU staff to ensure a successful and cost-effective program that meets all objectives of the CPUC. The program also leverages the existing contractual relationship between CDCR andESCOs to develop and implement energy projects in CDCR facilities. In 2016, CDCR re-established a pool of qualified ESCOs, and the IOUs provided a full day, in-depth training on energy efficiency programs, policies and procedures.

Regular Management and Executive Team meetings with program administrators are key to identifying and managing projects, and to proactively addressing any challenges the program may have faced. The CDCR Partnership has an ongoing challenge of finding funding for projects. OBF has been the primary source of funding and is supplemented by Special Repairs Project funding.

2016 Strategies and Successes

The CDCR Partnership completed a successful transition of the PAM role following a solicitation and award process managed by PG&E. Following the retirement of CDCR's Chief of Energy and Sustainability, and the appointment of a new Chief, the Partnership played an active role in orienting the new Chief to the portfolio of IOU energy efficiency resources. In addition to monthly management team meetings and quarterly executive team meetings, the Partnership instituted monthly project status meetings to ensure the Partnership deploys resources in a timely and effective manner. In 2016, the Partnership also delivered an in-depth training on energy efficiency resources to CDCR's new ESCO pool.

Local Government Partnerships Subprograms

PG&E's Local Government Partnership programs work with local governments to deliver energy services to city and county facilities and their communities. PG&E had 22 LGP in 2016 serving approximately 238 cities and 44 counties. In 2016, six partnerships previously under Local Government Energy Action Resources (LGEAR) were formally converted into stand-alone

programs including North Valley, Northern San Joaquin Valley, Solano, Sutter-Buttes, Valley Innovative Energy Watch (VIEW), and Yolo partnerships. These partnerships help meet the goals of the California Energy Efficiency Strategic Plan.[9]

Through LGPs, PG&E and local and regional partners work together to develop and implement programs that serve the public sector and the broader community, including SMB and non-profit customers. Over the past 10 years, PG&E's portfolio of LGPs has grown to cover most of PG&E's service territory, including 238 cities and 44 counties.

LGPs are the primary delivery channel supporting cities, counties, and other local agencies seeking energy savings and GHG emission reductions on the community-scale. Promoting energy planning at a statewide and local level is a major market driver in increasing the uptake of local government EE projects and extending the reach and effectiveness of PG&E's EE programs. Through LGPs, PG&E leverages the role of local governments to achieve deeper energy savings in both municipal facilities and the broader community as an integral part of other community climate action and sustainability programs.

PG&E LGPs are built around the communities which they serve. While local governments represent a majority of lead local partners, many LGPs are led by local economic development groups, associations of governments, joint power authorities and regional non-profit organizations. These local organizations have missions aligned with supporting the economic, environmental and societal health of their communities. Local partners are best positioned to understand and identify customers within their communities and effectively partner with program implementers to overcome barriers to energy efficiency adoption.

LGPs are designed to accomplish three broad goals:

1. Work with local governments to generate energy and demand savings within their own facilities and in their communities;
2. Take actions to support the California Energy Efficiency Strategic Plan objectives, and;
3. Provide DSM outreach and implementation of programs within the community

Over the past few years, Regional Direct Install programs have delivered the majority of SMB downstream energy savings for PG&E's energy efficiency portfolio. Through this offering, SMBs benefit from a high level of technical assistance and turnkey installation whereby the incentive payment is incorporated into to the project proposal.

Proposition 39 has opened another channel through which many LGPs are serving K-12 public schools by tailoring municipal energy efficiency programs to better meet their needs. Many LGPs are also reaching moderate income residential customers through targeted direct install programs, some of which support workforce development goals. These diverse segment approaches reflect how LGPs have matured into a reliable, integrated and innovative channel for PG&E's downstream, customer-facing energy efficiency portfolio.

LGPs also work to meet the targets of the California Energy Efficiency Strategic Plan by implementing energy efficiency strategies that support California's larger climate and GHG goals. Strategic Planning activities, also known as Strategic Energy Resources (SER), include

[9] California Public Utilities Commission. January 2011. *California Energy Efficiency Strategic Plan*. http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=5303

energy and climate action planning, green building codes, benchmarking policies and training. The Statewide Energy Efficiency Collaborative (SEEC) operated under the SER Program in 2016.

Association of Monterey Bay Area Governments Energy Watch

The Association of Monterey Bay Area Governments (AMBAG) Energy Watch is a partnership between AMBAG and PG&E. AMBAG is a Council of Governments that is governed by a twenty-four member Board of Directors comprised of elected officials. AMBAG Energy Watch region includes the Santa Cruz, Monterey and San Benito Counties and the 18 incorporated cities. AMBAG Energy Watch serves PG&E's municipal, schools, special district, non-profit, agriculture and residential customers. Services include energy assessments and audits, Prop 39 support, technical assistance, assistance accessing low or no-interest financing, benchmarking assistance, and development of and assisting with implementation of regional energy action strategies.

Services provided by AMBAG include engineering services, a Regional Direct Install Program through Ecology Action, and the MIDI Program. AMBAG Energy Watch also offers a robust public sector program, providing both turnkey and customized EE solutions for municipal facilities and schools.

2016 Strategies and Successes

In 2016, the AMBAG Energy Watch program continued to support school districts in the three counties in implementing energy efficiency projects funded by some combination of Prop 39 awards, PG&E incentives and OBF funding. The program provided school districts with a turn-key energy efficiency solution that included one or more of the following services depending on the unique needs: development and specification of quantities and performance requirements for equipment upgrades, preparation and submittal of Energy Expenditure Plans (EEP) to the State, administrative support related to PG&E program incentives and OBF funding, and communications support and technical assistance to district staff and leadership through to the completion of the project installation. This effort has been integral to making the AMBAG region a leader in school energy efficiency in the state. Out of about $15M in Prop 39 funding awarded to the AMBAG region, 92% was a result of the AMBAG Energy Watch program's assistance.

East Bay Energy Watch

East Bay Energy Watch (EBEW) is a partnership between PG&E, local governments, and energy service providers in the East Bay dedicated to providing the most cost-effective EE solutions for residents, businesses, and municipalities throughout Alameda and Contra Costa Counties. The EBEW partnership is guided by EBEW's Strategic Advisory Committee (SAC), consisting of local government staff spanning across the two counties, with a local government staff co-chair representing each county.

East Bay Energy Watch
2016 Program Highlights

- Engagement with and participation in the quarterly SAC meetings is at an all-time high
- Four SAC sub-committees were created in 2016 with three to five LG staff sitting on each sub-committee
- Sub-Committees include:
  - Municipal Program Enhancement
  - Policy and Regulatory
  - SMB Marketing & Outreach
  -Strategic Planning

The Strategic Advisory Committee is coordinated by StopWaste. Programs provided by the EBEW include:

- Small & Medium Business Direct Install
- No-Cost Residential/Workforce Development
- Municipal EE Technical Support

Program implementers include: DNVGL, Rising Sun Energy Center, and QuEST.

2016 Strategies and Successes
In 2016, EBEW began working with StopWaste and Contra Costa County administrators for the SAC. In 2016, local government engagement reached an all-time high with more than 20 local governments formally appointed to the Committee. Of important note is the significant growth in participation within Contra Costa County.

EBEW partners have experienced great success with the Civic Spark program that launched in 2015. The participation in this program grew in 2016 with the demand for the program actually exceeding the available resources. Through this program, local governments benefit from a full time or shared full time equivalent Fellow working on climate action issues in their communities. In combination with this capacity-building resource, EBEW continues to offer no-cost Building Operator Certifications (BOC) training (scholarships) for municipal employees, as well as no-cost participation in Lucid's Connected Cities program, leveraging interval data and dashboard technology to inform and educate both the public and civic employees on energy consumption and use patterns.

Fresno Energy Watch
Fresno Energy Watch (FEW) is a partnership that provides comprehensive EE services to the City of Fresno, County of Fresno, and the cities throughout the County of Fresno. The program is managed by the City of Fresno Department of Sustainability and the Economic Development Corporation serving Fresno County.

The FEW delivers cost-effective, comprehensive, and persistent energy savings through the leadership of the local government. The goals of the partnership are to provide comprehensive and integrated energy solutions, address community needs, and capture available energy savings. Locally based EE seminars are offered to expand the audience for EE. The FEW also focuses on local energy policies that promote EE practices, codes, and standards.

Services provided by FEW include Home Energy Tune-Up, a Regional Direct Install Program by RHA, a third party implementer, and the MIDI Program. The Home Energy Tune-Up provides in-home energy assessments as a service to residential customers living in Fresno, Madera, Kings, Tulare, Merced, Stanislaus, San Joaquin, and Kern Counties. Home Energy Tune-Up was previously funded by federal stimulus dollars under the ARRA). When ARRA dollars stopped coming to the city of Fresno, PG&E funded the program in Fresno and Madera Counties for the remaining six months of 2012, and in 2014 expanded the service to customers in Kings, Tulare, and San Joaquin Counties.

The program also provided benchmarking and limited audit services to qualified medium to large business customers through the Business Energy Tune Up program element.

Kern Energy Watch

Kern Energy Watch is a unique cooperative partnership between PG&E, SCE, SoCalGas, the County of Kern, and the partner cities within Kern County. The County of Kern serves as the partnership implementer and partners with the Kern Economic Development Corporation and other local agencies to provide support for outreach to small and medium sized businesses.

The Partnership provides assessments and the direct installation of energy saving measures by Staples Energy in qualifying residences, businesses, and municipal facilities throughout PG&E's service area in Kern County. The partnership also works to encourage the efficient use of energy by providing EE information at community events, by providing public and municipal education and training programs, and by providing audits and financial assistance to municipal customers for the energy efficient retrofit of municipal facilities.

Kern Energy Watch
2016 Program Highlights

- Benchmarking of County of Kern facilities
- Partnered with the City of Wasco to promote PG&E energy efficiency programs to homeowners and businesses and the energy efficient retrofit of City facilities.
- Provided direct install services to small and medium-sized businesses and Municipal customers reducing their utility costs by nearly $1,000,000 annually.

2016 Strategies and Successes

The Partnership is focused on assisting municipal customers with the benchmarking of their facilities, outreach to SMB customers, and partnering with local water agencies to promote the efficient use of both energy and water. There are also continued efforts to partner with County Supervisors to reach out to the small, rural, high poverty level communities to assist residents and businesses in utilizing the EE programs offered by PG&E and SoCalGas.

Madera Energy Watch

Madera Energy Watch (MEW) is a partnership that offers a range of EE options for commercial, small business and residential customers, as well as municipal facilities. The program is implemented by the Madera County Economic Development Commission. MEW works with local contractors, builders, building departments, and others to install energy efficient equipment to reduce energy use. Locally based training programs are offered to expand the audience for EE. MEW also focuses on local energy policies that promote EE practices, codes, and standards. MEW delivers cost-effective, comprehensive and persistent energy savings among local MEW partners.

Services provided by MEW include the Third Party and Government Partnership Direct Install Program. The program continued to offer the Home Energy Tune-Up as a service to residential customers living in Madera County (see Fresno Energy Watch section above).

Marin County Energy Watch

Marin County Energy Watch (MCEW) is a partnership between the County of Marin Community Development Agency and PG&E to deliver cost-effective and comprehensive energy savings and incentives to local governments, businesses, schools, residential, nonprofits, and special districts in Marin County. Services are delivered through three main program elements. The Marin Energy Management Team provides energy management services and assessments tailored to suit the unique needs of public agencies, municipal facilities, and schools in Marin County. The SmartLights Program, implemented by Community Energy Services Corporation (CESC), provides start-to-finish technical assistance and energy assessments to nonresidential customers for lighting and refrigeration retrofits. MCEW also works with California Youth Energy

Services to install hardware promoting energy efficiency, and delivers in-home energy assessments and education to residential owners and renters while providing green jobs for local youth.

In addition, MCEW assists cities and the county with climate action planning.

2016 Strategies and Successes
The program provides customers, especially municipal customers, with long-term comprehensive EE planning and implementation services.MCEW continued to deliver successful services to public schools in 2016 and plans to ramp down this support in 2017 as Prop 39 funding is rolled back.

Mendo-Lake Energy Watch
Mendo-Lake Energy Watch (MLEW) is a partnership between the Community Development Commission of Mendocino County and PG&E. MLEW offers a comprehensive portfolio of energy efficiency programs that target residential customers, municipalities, small businesses, and nonprofits in both Mendocino and Lake Counties.

Using a locally-driven approach, MLEW offers innovative energy efficiency programs and outreach services in one of the more sparsely populated counties in the state. The commercial program elements include a coordinated direct install program for lighting and refrigeration, education and outreach, and comprehensive energy audits for public facilities and small and medium businesses. MLEW also supports climate planning by providing municipalities with community-wide and municipal GHG emission inventories.

Services provided by MLEW include the Regional Direct Install Program via The Energy Alliance Association (TEAA), a third party implementer.

2016 Strategies and Successes
MLEW developed energy benchmarking policies and procedures to enable ongoing benchmarking of local government facilities. In 2016, MLEW was successful in benchmarking five facilities. The Partnership will continue to follow up with the facilities to encourage them to make energy efficiency retrofits.

Napa County Energy Watch
Napa County Energy Watch (NCEW) provides comprehensive energy efficiency services to municipalities, nonprofits, special districts and small and medium business customers. Sustainable Napa County serves as the local program administrator. Services include audits, retrofits, outreach, and education. NCEW is uniquely positioned to influence energy conservation thanks to its deep roots and stellar reputation among municipalities, non-profits, and the vintner community. The partnership supports climate planning by taking the long-view, often including broader sustainability ventures across Napa County.

Services provided by NCEW include the Regional Direct Install Program by TEAA.

2016 Strategies and Successes
The program works in close coordination with PG&E customer relationship managers, active Third Party programs, and local trade associations in the County of Napa to deliver comprehensive EE services to customers. In 2016, the Partnership coordinated with the third party winery program to better serve small wineries with the Regional Direct Install program.

North Valley Energy Watch

North Valley Energy Watch (NVEW) is managed by Northern Rural Communities Development, Inc. (NRCD). The NVEW develops, implements, and promotes commercial energy efficiency programs in Butte, Shasta, Glenn and Tehama counties to small and medium-sized businesses and promotes energy efficiency education to residents. In addition to the local governments, NVEW works with local workforce investment boards to leverage existing relationships with small to medium-sized businesses. NRCD's Direct Install Program is provided via Richard Heath Associates (RHA), a third party implementer.

In 2016, NVEW continued to develop relationships with local agencies and further developed their relationships with the participating municipalities providing continued educational support, EE planning and implementation services.

North Valley Energy Watch
2016 Program Highlights

- Created Do-It-Yourself Energy Saving Toolkits for residents and small businesses which are accessible through the public libraries in all four counties.
- The DIY toolkit was also used to train 70 middle school STEM instructors on how to teach energy efficiency to middle school students.
- The Energy Watch supported PG&E's efforts to avoid expensive grid upgrades by achieving targeted reductions in energy load via an effort called Targeted Demand-Side Management (TDSM).

2016 Strategies and Successes

NVEW created "Do-It Yourself" Energy Savings toolkits for residential and small commercial customers. The kits are available at libraries and can be checked out to help customers reduce their home or small businesses energy and water use, The kits include information on energy efficiency retrofit ideas and self-install products.

Northern San Joaquin Valley Energy Watch

In 2016, implementation of the Northern San Joaquin Valley partnership transitioned from Great Valley Center to Valley Vision. In addition to performing GHG inventories and climate action plans for jurisdictions in the Central Valley, Valley Vision implemented the Energy Careers Experience Program that provides paid college student interns to PG&E offices throughout the Central Valley. These interns assisted customers with energy assessments, community outreach, and other energy efficiency resources.

Redwood Coast Energy Watch

Redwood Coast Energy Watch (RCEW) is a partnership between PG&E and Redwood Coast Energy Authority (RCEA). RCEA is a Joint Powers Authority whose members include the County of Humboldt; the Cities of Arcata, Blue Lake, Eureka, Ferndale, Fortuna, Rio Dell, and Trinidad; and, the Humboldt Bay Municipal Water District. RCEW achieves energy savings through a comprehensive, locally-driven approach in Humboldt County.

Redwood Coast Energy Watch
2016 Program Highlights

- Continued to engage residential customers through the Residential Direct Install, delivering approximately 7,000 therms savings
- Provided a Workforce Development pathway that encourages learning, development and advancement in California's energy efficiency industry.

RCEW provides comprehensive energy management services and incentives through three main program elements. The Small Business Direct Install program offers hard-to-reach, small businesses with turnkey services as well as project management by a RCEA energy specialist. The Residential Program offers single-family homeowners no-cost energy assessments and installs a range of low-cost and no-cost measures while promoting PG&E's Residential Rebate Program. RCEA offers larger customers project management assistance with nonresidential retrofit projects. RCEA also offers climate and energy planning assistance to reduce community energy usage.

2016 Strategies and Successes
In 2016, the program delivered energy savings through its Small Business Energy Efficiency Program, a Residential Direct Install Program, a Non-Profit Energy Efficiency Program, and a Public Agency Energy Efficiency Program. The Redwood Coast Energy Authority's commercial and residential programs have been the catalyst for multiple EE, GHG reduction, and renewable energy development projects.

San Francisco Energy Watch
San Francisco Energy Watch (SFEW) is a Partnership between the City and County of San Francisco and PG&E to deliver a broad spectrum of energy efficiency measures and savings for businesses as well as multifamily facilities in San Francisco. SFEW provides comprehensive energy management services and incentives through three main program elements. The Small Business Direct Install Program offers hard-to-reach, small businesses turnkey services, and complete project management by a program-assigned contractor. The Commercial Plus and Multi-Family Plus programs use a market-based, vendor-driven model to offer property owners and larger businesses technical assistance and energy assessments for installing a wide range of low-cost measures. SFEW also offers larger customers incentives for calculated, nonresidential retrofit projects.

SFEW also leverages Strategic Energy Resource funding for long-term energy efficiency planning and bringing innovative solutions to San Francisco customers.

Services provided by SFEW include the Local Government Partner Commercial Direct Install Program and the Local Government Partner Residential Direct Install.

2016 Strategies and Successes
The program continued outreach to business organizations such as the Hotel Council, San Francisco District Merchant Association, SF Chamber of Commerce and Building Owners and Managers Association, Low Income Investment Fund, San Francisco Economic Development Alliance, and others to promote SFEW programs

SFEW completed or continued numerous campaigns in 2016 focused on the hospitality sector, SFOs, non-class A buildings, retail, and faith based organizations. They have assessed the metrics and lessons learned from these campaigns and are continuing their successful efforts in 2017. Through these campaigns and other outreach, the program completed projects saving 5.9m kWh and 1071 kW. The partnership made the most impact in hospitality, offices, and retail with projects saving 1.3m kWh, 1.89m kWh and 759k kWh respectively.

SFEW also leveraged SER funding to address several areas, including addressing maintenance issues at SMBs in the food and beverage sector. Participants in this program on average reduced 14% of their refrigeration energy through training on preventive maintenance and other

interventions. The SER funded microloan program was set up in 2016 and will serve customers in 2017 to provide copays for SFEW projects.

San Luis Obispo County Energy Watch

San Luis Obispo County Energy Watch is a partnership between PG&E, SoCalGas, the County of San Luis Obispo, the seven incorporated cities within San Luis Obispo County, and participating Community Service Districts (CSD). The County of San Luis Obispo serves as the partnership implementer, providing information and energy management and climate action planning service to municipal customers, and supporting EE services for other local residential and non-residential EE programs including a Regional Direct Install Program.

San Luis Obispo Energy Watch
2016 Program Highlights

- Engaged nine underserved Community Service Districts in energy efficiency project identification.
- Developed energy benchmarking reports for seven cities.
- Installed first phase of large County energy efficiency retrofit project.
- Updated County's EnergyWise Plan (i.e., energy action plan).

2016 Strategies and Successes

The Energy Watch program identified high potential projects at CSD facilities based upon the results of PG&E's Large Integrated Audit Program. The program developed energy benchmarking reports for seven cities with support from CivicSpark Fellows. Toward the end of 2016, these reports were used to educate city officials on energy efficiency strategies and available resources. In 2017, the Energy Watch program will continue to assist these cities in developing and implementing energy efficiency retrofit projects at their facilities, leveraging partnership technical expertise, rebates, and on-bill financing programs. The recommendations of a 2015 County facilities assessment resulted in the implementation of the first phase of a large energy efficiency retrofit project for multiple County facilities utilizing PG&E's Sustainable Solutions Turnkey (SST) program. Program staff updated County's EnergyWise Plan (i.e., energy action plan), and presented to the County Board of Supervisors, highlighting the energy efficiency achievements made to date.

San Mateo County Energy Watch

San Mateo County Energy Watch (SMCEW) is a partnership between the City/County Association of Governments of San Mateo County (C/CAG) and PG&E. SMCEW's goal is to reduce energy usage through energy efficiency in San Mateo County, including its twenty cities and unincorporated areas. C/CAG is a Joint Powers Authority consisting of all 20 cities and the County of San Mateo that enables direct contact to all levels of management at the city and county governments.

SMCEW delivers a comprehensive portfolio of EE services to public agencies, nonprofits, small businesses, schools, and residential customers including direct install programs for lighting and refrigeration measures, audits, benchmarking, technical assistance for more complex EE projects through PG&E's Customized Retrofit Program, as well as education and training programs.

Services provided by SMCEW include a Regional Direct Install Program (DI) and a Customized Engineering Program implemented by Ecology Action, and a MIDI Program implemented by El Concilio. SMCEW staff partner closely with Ecology Action by identifying and driving EE retrofit opportunities, and by building a pool of qualified local contractors who can serve the DI

program. The SMCEW is also developing a retrofit program targeting very small customers, which are difficult to serve cost-effectively through the DI program.

2016 Strategies and Successes

In 2016, SMCEW continued to serve local governments with energy efficiency retrofit projects. A three-part retrofit project at the City of Belmont using PG&E's Sustainable Solutions Turnkey (SST) program concluded its final phase. SMCEW also worked on projects targeting facilities at the County of San Mateo, Daly City, Millbrae, San Bruno, and San Carlos. SMCEW and implementer Ecology Action were approved to support SamTrans and Caltrain to address lighting efficiency at their stations, operations bases, and offices, and they began scoping a pilot project at the San Carlos station.

SMCEW was selected to spearhead a ZNE pilot program by the California Public Utilities Commission (CPUC) for San Mateo County, which resulted in a County ZNE Strategic Plan and initial conversations with the County Council about a County Facility ZNE policy. SMCEW's work from the pilot was presented at 3 ZNE conferences statewide by the New Buildings Institute on behalf of the CPUC. Additionally, the San Mateo County Regionally Integrated Climate Action Planning Suite (RICAPS) Initiative was awarded a Climate Leadership Award by the US EPA for its coordinated countywide approach to climate action planning and energy efficiency programming. Two cities adopted Climate Action Plans (CAPs) in 2016, 1 city was awaiting CAP adoption, and 4 cities were in the process of updating their CAPs. The program also began the process of launching a Resource Conservation Kit to be made available at libraries in San Mateo County. The Silicon Valley Energy Watch, which offers this in Santa Clara County, is collaborating on this effort.

Santa Barbara County Energy Watch

Santa Barbara County Energy Watch is a partnership between PG&E, SoCalGas, and the Santa Maria Valley Chamber of Commerce. The partnership covers only the northern portion of the County, which is the southern limit of PG&E's service territory, and serves the municipalities of Buellton, Solvang, Guadalupe, Santa Maria, and the County of Santa Barbara.

Santa Barbara Energy Watch
2016 Program Highlights

- Coordinated an energy efficiency campaign in Solvang and helped to develop 3 retrofit projects at City facilities. Also, awarded a grant to the Solvang Chamber of Commerce to provide for significant outreach to businesses and residents.
- Provided **direct install services to 58 small and medium-sized businesses** and Municipal customers

The partnership provides assessments and the direct installation of energy saving measures to qualifying residences, businesses, and municipal facilities throughout the northern Santa Barbara County service area. The partnership also works to encourage the efficient use of energy by providing EE information at community events, public and municipal education and training programs, as well as audits and financial assistance to qualifying customers for energy efficiency retrofits at their facilities.

2016 Strategies and Successes

In 2016, the Santa Barbara County Energy Watch completed 58 EE retrofit projects through the Regional Direct Install program. Additionally, the partnership reached out directly to residents, businesses and local governments through targeted outreach, including events and presentations conducted in the cities of Los Alamos, Santa Maria, Solvang, and Buellton. A grant was also awarded to the Solvang Chamber of Commerce to conduct energy efficiency

related outreach to the community's residents and businesses. This outreach campaign included a website, one on one contact with businesses, direct mailers, media advertising and radio interviews. An additional grant was provided to the City of Solvang to upgrade municipal buildings through the Direct Install program. The Energy Watch program also received energy related proclamations and resolutions from the Cities of Santa Maria, Buellton, Solvang, and the County of Santa Barbara, and will continue assist those local governments with EE resources and programs.

Sierra Nevada Energy Watch

Sierra Nevada Energy Watch (SNEW) is a partnership between PG&E and Sierra Business Council, a non-profit sustainability organization serving the Sierra Nevada region. The SNEW territory is comprised of 11 rural Sierra counties, including Lassen, Plumas, Sierra, Nevada, Placer, El Dorado, Amador, Calaveras, Alpine, Tuolumne, and Mariposa. SNEW is dedicated to providing innovative EE solutions for local governments and businesses throughout the Sierra. SNEW coordinates the strengths of PG&E and the counties and cities within the foothill region to overcome energy-efficiency barriers and better serve the unique needs of small mountain and rural communities.

SNEW provides comprehensive, sustained technical services to municipal, nonprofit, and small business customers. SNEW's Commercial Program includes the Energy Watch Tune-Up Program to help businesses save energy and money. This regional program provides a comprehensive energy assessment, delivers money-saving measures, and connects businesses with other energy saving opportunities. The Energy Watch Municipal Program offers assistance with benchmarking and energy assessments of government facilities and provides low-cost EE equipment, as well as climate and energy planning to reduce community energy usage.

Services provided by SNEW include the Small Commercial Direct Install Program and the Regional Direct Install Program implemented by Sierra Business Council.

2016 Strategies and Successes

SNEW continues to find success with the Water-Energy Nexus assessment and works with water agencies providing leak detection training. The partnership completed two sets of leak loss detection trainings.

The partnership brought Title 24 trainings to their local jurisdictions which are rural areas. This allows participants to attend classes in their local communities who would otherwise have to travel a far distance.

To date, SNEW has successfully engaged nine cities in Energy Action Planning activities to help reduce community energy usage.

Silicon Valley Energy Watch

Started in 2004, the Silicon Valley Energy Watch (SVEW) provides targeted energy efficiency education, outreach, energy savings delivery, and overall energy program coordination to 14 jurisdictions in Santa Clara County. Implemented locally by the City of San Jose, SVEW collaborates with PG&E, other local stakeholders, and implementers to augment the success of regional programs through enhanced coordination and outreach, and ensure that targeted customers take advantage of energy efficiency audits, rebates and OBF financing, benchmarking reports, education and training offerings, and other resources and services.

Services provided by SVEW include a Regional Direct Install Program and a Customized Engineering Program implemented by Ecology Action and a MIDI Program implemented by Quality Conservation Services Inc.

2016 Strategies and Successes

In 2016, SVEW expanded its focus on supporting energy efficiency retrofits at schools, and submitted five Prop 39 energy expenditure plans (EEPs) for local educational agencies (LEAs) in the county, which together account for about 960,000 kWh of annual energy savings. SVEW worked with CommUniverCity San Jose's Green Ninja team to expand their Do-It-Yourself (DIY) Home Energy Saving Toolkit program into middle schools, reaching 565 students and their families. The toolkit box is stocked with energy and water measures, measuring devices, and step-by-step instructions to empower the user to understand their energy and water resource consumption patterns, and inform them how to become more efficient. In the commercial sector, the San Jose Step Up and Power Down pilot successfully concluded in 2016, surpassing its original enrollee and energy reduction goals. The pilot, which provided participants with simple, energy saving strategies, tools and feedback, resulted in an energy savings commitment of 27M kWh from 438 businesses in the five highest energy using zip codes in the city. SVEW's primary non-resource activity in 2016 was the development of an Energy Innovation and Climate Action Planning Grant program, which will solicit proposals in early 2017. The grant program will provide local governments with the resources to conduct climate action planning activities and/or provide other non-resource energy-efficiency programs to Santa Clara County PG&E customers. Up to 14 grants will be issued for a total amount of $180,000.

Solano Energy Watch

Solano Energy Watch (SEW) provides comprehensive EE services to municipalities, nonprofits, special districts, SMBs, and residential customers. The partnership is led by the three Solano Economic Development Corporation and the County of Solano. Each partner specializes in different target markets and brings their local expertise to serve the community. Services include audits, retrofits and outreach. The partnership launched in 2014 and has showed great strength in outreach to Solano County residents, SMB customers, and municipalities.

Services provided by SEW include the Regional Direct Install Program by TEAA, a third party implementer, and residential direct install with the California Youth Energy Services Program by Rising Sun Energy Center.

2016 Strategies and Successes

Solano EDC promotes energy efficiency through the perspective of economic development and strengthening economic viability. By reducing energy costs through energy efficiency, those dollars can be reinvested back into businesses. Solano EDC actively engages with SMB customers via direct outreach in coordination with TEAA, the direct install implementer. Last year, of all the SMB customers touched by the Partnership, approximately 70% agreed to complete an energy efficiency retrofit.

Sonoma County Energy Watch

Sonoma County Energy Watch (SCEW) offers a comprehensive portfolio of energy efficiency programs that target municipalities, nonprofits, small and medium businesses, and residential customers. The local administrator, County of Sonoma Department of General Services, aims to lead by example and is working in partnership with other cities in the county to promote programs and initiatives in energy conservation and efficiency, clean energy generation, and environmental programs.

Services provided by SCEW include the Regional Direct Install Program implemented by TEAA and a residential direct install and education program that employs youth energy specialists administered by Rising Sun Energy Center.

2016 Strategies and Successes

The Partnership supported a TDSM initiative for the SMB customers served by the Rincon substation. The goal of the Partnership was to reduce demand load through energy efficiency retrofits implemented through the Regional Direct Install program. The intent is to help reduce the need to increase service capacity at the substation. The partnership was successful in reaching out and completing energy efficiency audits for the majority of SMB customers tied to the Rincon substation. The next phase is to complete energy efficiency retrofits. The initiative will continue into 2017.

Sutter Buttes Energy Watch

Sutter Buttes Energy Watch (SBEW) is a partnership that includes Colusa, Sutter and Yuba Counties. The goal of this partnership is to promote energy efficiency and the reduction of greenhouse gas emissions in local government operations. SBEW concentrates on government facilities, nonprofit organizations, small businesses, residences, farms, schools and factories promoting energy efficient programs. SBEW provides a direct-install program that provides energy efficient measures to municipal facilities, non-profit businesses, special districts and hard-to-reach SMBs. In addition to the direct install program, the SBEW brings energy efficiency training and workshops, a tool lending library and a MIDI program.

2016 Strategies and Successes

SBEW continues to focus on promoting and developing new relationships within the counties, while promoting PG&E energy efficiency programs.

Valley Innovative Energy Watch

Valley Innovative Energy Watch (VIEW) is a unique cooperative partnership between PG&E, SCE, SoCalGas, the County of Kings, the County of Tulare and the partner cities within these counties. The San Joaquin Valley Clean Energy Organization serves as the partnership implementer.

The Partnership provides assessments and the direct installation of energy saving measures in qualifying residences and businesses and benchmarking, audits and project management assistance for city and county facilities located in the PG&E service area. The partnership also works to encourage the efficient use of energy by providing EE information at community events, by providing public and municipal education and training programs, and by providing financial assistance to municipal customers for the energy efficient retrofit of municipal facilities.

Valley Innovative Energy Watch (VIEW)
2016 Program Highlights

- VIEW organized a community outreach event with Kings County Supervisor Doug Verboon in the community of Hardwick.
- Organized a community outreach event with Tulare County Supervisor Pete Vander Poel in the community of Alllensworth.
- Organized a community outreach event with Tulare County Supervisor Steve Worthley in the communities of Sultana/Monson.
- Provided direct install services in Kings and Tulare Counties to **51 small and medium-sized businesses** and Municipal customers reducing their utility costs by over $250,000 annually.

2016 Strategies and Successes

In 2016, the VIEW Partnership expanded its efforts to assist the Partnerships throughout the San Joaquin Valley with benchmarking and EE project development for municipalities. The Partnership also continued its efforts to partner with County Supervisors to reach out to the small, rural, high poverty level communities to assist the residents and businesses in utilizing the EE programs offered by PG&E, SCE and SoCalGas.

Yolo Energy Watch

Yolo Energy Watch (YEW) promotes EE and the reduction of GHG emissions in local government operations. In addition, YEW promotes the reduction of GHG emissions throughout the community primarily through programs targeting government facilities, nonprofit organizations, small businesses, residences, farms, schools and factories in Yolo County. YEW provides a direct-install program that provides energy efficient measures to municipal facilities, non-profit businesses, special districts and hard-to-reach SMBs. In addition to the direct install program, the YEW brings EE training and workshops to the residents making the classes easier to attend.

Services provided by YEW include the Regional Direct Install program implemented by RHA.

2016 Strategies and Successes

Yolo Energy Watch continues to work with local governments to educate and support small businesses with energy efficient measures and education. YEW coordinated with the City of Woodland to promote the Step Up Power Down program, a behavior-based marketing campaign to engage large and small business customers with the goal of reducing energy waste on a community level.

YEW also sponsored a “Festival of Services” in the small community of Madison. The local direct install implementer, RHA, retrofitted a few small businesses in Madison and then showcased the retrofits at the event. The festival was organized in conjunction with the local county supervisor’s office, which helped bring more community awareness to YEW and energy efficiency resources.

California Green Business Program

PG&E supports the EE-related implementation of the California Green Business Program (GBP) by partnering with the California Green Business Network (CAGBN). GBP is a state-recognized program to guide SMBs toward more sustainable operations including solid waste, pollution prevention, energy efficiency and water conservation. A network of GBPs run at the city and county level across the State has joined forces to share resources and they are collectively called the California Green Business Network. In 2016 PG&E dispersed funding to 10 local GBPs and acted as the administrator of a statewide database essential to the function of all GBPs statewide. This funding has allowed for the use of student interns from various Green Jobs training programs to conduct energy audits and provide technical assistance to SMBs.

2016 Strategies and Successes

The CAGBN has been working in collaboration with PG&E to direct green business leads to PG&E’s SMB team through their upgraded database. The SMB team will connect these customers to PG&E services and programs that will aid in their Green Business Certification. GBPs were launched in two new areas in the Central Valley: San Joaquin County and Fresno County. Furthermore, PG&E assisted the network by supporting the development of co-branded marketing collateral for distribution to businesses by the GBPs and PG&E alike.

Statewide Energy Efficiency Collaborative

The Statewide Energy Efficiency Collaborative (SEEC) is a collaboration among three statewide non-profit organizations and California's four IOUs. SEEC provides education and tools for climate action planning, venues for peer-to-peer networking, technical assistance and recognition for local agencies that reduce GHG emissions and energy use. SEEC partners include the Local Government Commission, the Institute for Local Government, and ICLEI – Local Governments for Sustainability, as well as the Statewide Local Government Energy Efficiency Best Practices Coordinator (the Coordinator). PG&E acts as lead coordinator for ICLEI's involvement in SEEC.

2016 Strategies and Successes

At the annual SEEC Forum, there were 320 participants the highest level of participation since 2010, representing 90 unique cities, counties, and regional agencies. Twenty-six new emissions management calculators were developed for the ClearPath software tool, 128 Community and 53 Government Operations inventories were created in 2016, and 83 new US cities are now using ClearPath. ClearPath was selected as the official reporting tool for the Compact of Mayors and now supports one-click reporting of summary data to the Carbonn Climate Registry (cCR) reporting platform. There were 23 new Beacon Participants, totaling 100 cities and counties representing more than 30% of California's population. A record number of cities and counties were awarded, including 83 Spotlight Awards and 8 full Beacon Awards. Moreover, the Coordinator shared 731 funding opportunities, news highlights, project highlights, events, and other items of interest to over 900 local government staff and other key stakeholders through the weekly updates listserv. Under ICLEI's lead, and with the support of SEEC partners, OPR, ARB and others, SEEC released the State of Local Climate Action Report, summarizing trends in energy and climate action in California.

Third Party Programs

Third Party programs provide turnkey and concierge services for PG&E's customers, which facilitate participation in EE programs. Third Party programs are more locally-focused than the IOUs' statewide programs and serve niche and hard-to-reach markets. Third parties are responsible for the program implementation, including project design, technical assistance, outreach and marketing, implementation, job processing, quality assurance and control, and in some cases, incentive payments. Third Party programs are designed to either implement new and innovative ideas or meet local needs and produce the most cost effective energy savings that meet or exceed savings goals.

PG&E's Third Party Program Objectives

PG&E's Third Party programs overarching objectives are to:

- Serve as a test-bed for new ideas, advanced technologies or innovative approaches
- Provide targeted solutions for customers including stranded energy savings opportunities
- Engage "niche" customers that are traditionally harder to reach (geographically or demographically)
- Serve as sales channel partners to help educate customers about other program offerings and drive comprehensiveness to maximize customer interaction

Residential Third Party Programs

PG&E's Residential Third Party programs are an integral component of its overall residential sector strategy to help provide customers with energy efficient solutions and services. PG&E completed a solicitation in 2015 through the IDEEA365 process, which facilitates the introduction of innovative ideas and technologies into the energy efficiency portfolio. The solicitation resulted in the launch of the Energy Fitness Program in 2016.

Energy Fitness Program

Implementer: Richard Heath Associates

The Residential Energy Fitness Program (REFP) was selected through an innovative solicitation conducted in 2015. Key components include enhanced methods to target customers and deliver customer education. This direct install program includes energy education, in-home assessment, installation of no cost and low cost measures, and ongoing education to monitor energy usage after participating in the subprogram. The subprogram was launched in June 2016 and assisted targeted customers with energy efficiency upgrades, and improving existing heating and air conditioner efficiency through duct sealing, efficient motors and fan controls, and refrigerant charge adjustment, among others.

California New Homes Multifamily Program

Implementer: TRC

The CMFNH subprogram provides comprehensive support for saving energy in the residential new construction sector with a cross-cutting focus on sustainable design and construction, green building practices, EE, and emerging technologies. Through a combination of education, design assistance, and financial support, the CMFNH encourages building and related industries to exceed California's Title 24 standards and prepare builders for future changes to these standards.

Enhanced Time Delay Relay Program

Implementer: Proctor Engineering

The Enhanced Time Delay Relay subprogram (also known as the Cooling Optimizer subprogram) is a direct install program serving multifamily residential customers in targeted climate zones. While the program previously served both single family and mobile home customers, the focus shifted exclusively to multifamily customers in 2016 to increase penetration in this hard to reach segment. The multifamily program offers property managers a no cost tune-up, fan delay relay installation, high efficiency BPM fan motor installation, as well as incentives for establishing a maintenance contract. This focus on maintaining a properly tuned air conditioner can improve tenant comfort and reduce their costs. In partnership with Enovative Group, Inc., the subprogram also began offering an on-demand recirculation pump control for multifamily buildings with central water heating in 2016. Demand based controls can reduce recirculation pump run time and provides equipment life and maintenance benefits.

Direct Install for Manufactured and Mobile Homes Program

Implementer: Synergy Companies

The Direct Install for Manufactured and Mobile Homes subprogram is a direct installation, no-cost-to-the-customer, program that serves the hard-to-reach residents of manufactured homes and mobile home parks. It also targets a variety of non-English speaking customers. The subprogram improves the efficiency of air conditioners by providing air conditioning tune-up and refrigerant charge adjustment, fan controls to save energy by running the fan at the end of the compressor cycle, and high efficiency blower motor upgrades. The subprogram also offers installation of Tier II Smart Power Strips and ENERGY STAR® rated products including lighting, low-flow showerheads, and aerators.

PG&E's Direct Install for Manufactured and Mobile Homes offers hard-to-reach customers low-cost options to save energy and lower their energy bills.

Commercial Third Party Programs

Third party programs offer a turnkey approach that continues to deliver savings, serve customer needs, and remain innovative by adapting to changing market needs. PG&E offers a variety of Commercial third party programs that span various market segments, targeting many of PG&E's harder-to-reach customers.

Commercial Third Party Programs	Retail	Office	Hospitality	Municipal, Universities, Schools, Hospitals (MUSH)	SMB
Boiler Energy Efficiency	x	x		x	
Energy Smart Grocer	x				x
Retail Energy Efficiency	x				x
LED Accelerator	x	x		x	
Hospitality			X		x
K-12 School Private Schools				x	
Healthcare Energy Efficiency Program				x	x
Commercial Real Estate Outreach (IDEEA 365)		x			
Data Centers Plus (IDEEA 365)		x		x	x
Energize Schools (IDEEA 365)				x	
Analytics-Enabled RCx (IDEEA 365)				x	x
School Energy Efficiency				x	

Commercial Industrial Boiler Efficiency Program

Implementer: Enovity

The Commercial Industrial Boiler Efficiency Program provides a turnkey rebate offering with no-cost technical services and rebates to identify and implement boiler and steam system efficiency projects. The program helps customers by identifying and evaluating opportunities at a facility, assisting with implementation, verifying the final results, and providing rebates and incentive checks. The Boiler Efficiency Program saw success with both fixed rebates and customized incentives. Providing in-depth measurements and calculations, Enovity identified opportunities for customers to save energy and money through projects that involved heat recovery, repairs, tune-ups, and boiler replacements.

EnergySmart Grocer Program

Implementer: CLEAResult

The EnergySmart Grocer Program provides comprehensive EE services for medium to large grocery stores and supermarkets in the PG&E service territory. The program provides comprehensive energy audits, long-term energy planning, and support for the implementation of efficiency measures.

2016 Strategies and Successes

Notably, in 2016, the program delivered 15.9 million kWh and 2,015 kW savings. The program has successfully partnered with PG&E account representatives to leverage PG&E's On-Bill Financing (OBF) Program to implement large-scale and complex retrofit projects delivering deeper savings.

Retail Energy Efficiency Program (REEP)

Implementer: Matrix Energy Services

The Retail Energy Efficiency Program provides retail chain stores with lighting and HVAC upgrades designed specifically for their commercial spaces. It is designed as a quick turnaround program specifically targeting corporate chains with 10 or more stores within PG&E's service territory. The Matrix program staff conducts energy audits at the customer's facility and recommends EE upgrades. Matrix's team of skilled installers then performs the agreed-upon equipment retrofits.

2016 Strategies and Successes

The program continued to utilize robust integration with PG&E's account representatives and program implementation team. Specifically, the program continued to operate a full-service call center for inbound and outbound calls, as well as customer referrals to market and schedule assessments. The call center is also used to follow up with customers who have received mailing campaign collateral as another way to enhance lead conversion.

Given the program's success in 2015, REEP was expanded in 2016 to serve additional retail customers, not limited to furniture stores. With this larger set of customers, the program captured 2,788,941 kWh in savings across 64 projects.

LED Accelerator (LEDA) Program

Implementer: Energy Solutions

LED Accelerator encourages large commercial retail customers to install best-in-class LEDs with the goal of increasing the quality of LEDs offered to the broader market over time. The program offers three tiers of equipment specifications and incentives, helping create a market

for manufacturers' best-in-class products and enabling customers to overcome cost barriers associated with more expensive offerings. As sales volumes of the best-in-class products increase, the associated product costs decrease, and products with higher efficacy and better light quality become readily available to the general market.

2016 Strategies and Successes

LEDA provides technical services that include audits, LED product selection, pilot demonstration, economic analysis for decision making, financing assistance, monitoring, and application support. Specific strategies for successful projects included:

- Informing customers about innovative LEDs and encouraging the installation of higher quality EE products than originally specified.
- Establishing compelling proposals, including financial incentives and project financials, for decision makers to move forward on projects.
- Conducting post-audits to ensure more accurate energy results and implementing a robust quality assistance and quality control program.

Hospitality Program

Implementer: Ecology Action

PG&E's Hospitality Program offers a comprehensive list of EE measures and services specifically designed to meet the complex needs of the hospitality market. The Hospitality Program offers both custom and deemed measures, and assists customers with EE projects from start to finish.

2016 Strategies and Successes

The Hospitality Program was able to develop strong working relationships in 2016 with lodging customers and chain customers in particular. In addition, the program began serving full-service restaurants in 2016 and will be targeting this segment for a larger roll-out in 2017 based on early successes. Existing relationships allowed the program to work with these customers continuously over time on multiple projects, and also identify and work with the decision makers of chain customers, which is frequently a considerable barrier to participation. This helped support the coordination and implementation of projects across hotels of the same chain. In total, the program completed 200 projects in 2016 that delivered more than 14 million kWh of savings. These 200 projects represent a near doubling of the number of projects completed in 2015.

K-12 Private Schools and Colleges Audit and Retrofit Program

Implementer: Matrix Energy Services, Inc.

The K-12 Private Schools and Colleges Audit and Retrofit Program provides comprehensive EE services to private preschools, K-12 schools, colleges, universities, and trade/technical schools. The program works with customers to identify both deemed and custom EE measures. It also provides technical and project implementation assistance to ensure qualified measures are installed.

Healthcare Energy Efficiency Program

Implementer: Willdan

The Healthcare Energy Efficiency Program (HEEP) provides hospital facilities (medical office buildings and acute care facilities) a wide range of support services to address barriers to EE. HEEP delivers electric and gas savings through retrofits (deemed and calculated) and RCx services. The Healthcare Energy Efficiency program had program success in HVAC custom measures and deemed lighting measures and paid 25 projects containing 3,398,702 kWh in

savings. Approximately 70% of the savings came from HVAC measures. The HEEP program will continue to target large healthcare facilities and Willdan will leverage past experience with OSHPOD requirements to deliver customers with targeted value propositions.

Commercial Real Estate Outreach (IDEEA 365)

Implementer: Waypoint

The Waypoint Connect program provides comprehensive analysis of multiple buildings within property ownership or management and originates energy efficiency retrofit projects. This innovative program leverages existing market infrastructure and data to overcome barriers with traditional energy efficiency programs. In 2016, the program benchmarked 105 buildings, completed 23 audits, and submitted 9 signed incentive applications totaling 1,267,000 kWh.

Data Center Air Flow and Temperature Optimization Program (IDEEA 365)

Implementer: CLEAResult

The Data Center Air Flow and Temperature Optimization Program provides comprehensive EE offerings targeted to small and medium-size data centers embedded within customer buildings. The program works with customers to conduct preliminary screening calls and in-depth assessments that help customers identify energy saving best practices and develop specific plans of action to implement EE improvements. This program will close in Q2 of 2017.

2016 Strategies and Successes

Building on customer leads, screenings, and data center assessments, the program built a pipeline of projects and delivered savings on its first project in 2016. Converting the pipeline into actual projects remained a challenge in 2016. PG&E attempted to address this issue by expanding the set of eligible customers and working closely with the Custom Implementation Team. However, the program continued to experience difficulties in delivering projects and will be closed in Q2 of 2017.

Energize Schools Program (IDEEA 365)

Implementer: Strategic Energy Innovations

Energize Schools is a non-resource program to assist K-12 schools in planning for and implementing Prop 39 energy projects while educating students and teachers in energy conservation and efficiency.

2016 Strategies and Successes

In 2016 SEI Energize focused on assisting Tier 1 and Tier 2 schools in receiving Prop 39 funds by providing technical services including benchmarking and audits for 7 schools and in submitting 10 Energy Expenditure Plans.

Energize Schools held an energy conservation competition in Fall 2016 with 61 schools throughout PG&E service territory. Students learned valuable lessons while conserving 8,600 kWh throughout the three-week period. SEI also worked closely with teachers and developed 125 curriculum products and age appropriate energy copy to be used as leave-behind materials by PG&E in future campaigns.

School Energy Efficiency Program

Implementer: CLEAResult

The School Energy Efficiency (SEE) Program helps K-12 public schools and their contractors identify, evaluate, and implement EE retrofit measures through technical analysis, measure prioritization, and engineering support.

2016 Strategies and Successes

The SEE Program is structured as a no-cost technical assistance and support program to identify projects and see them through by working alongside the customer. This structure enables the SEE Program to work with the school district without triggering the unique construction, bidding and wage requirements of California public school districts. In 2016, SEE had particular success assisting schools with pool retrofits and VFDs.

School Energy Efficiency
2016 Program Highlights

- In response to **Proposition 39 (Prop 39)**, the Clean Energy Jobs Act, PG&E added the Prop 39 SEE Bonus offering to provide K-12 districts with benchmarking, energy auditing, and Prop 39 application support at no cost.

  The offering is targeted towards smaller, understaffed schools. The program served **19 local educational agencies** in 2016.

Industrial and Agricultural Third Party Programs

Third Party programs represent an important delivery channel for the Industrial and Agricultural sectors. The programs offer a turnkey approach that continues to deliver savings, serve customer needs as well as stay innovative by adapting to changing market needs.

PG&E's 2016 Industrial and Agricultural Third Party Programs
Industrial
• Heavy Industry Energy Efficiency • Industrial Retrocommissioning • Industrial Compressed Air System • Light Industrial Energy Efficiency
Oil
• Energy Efficiency Services for Oil and Gas Production • Refinery Energy Efficiency • Small Petrochemical Energy Efficiency
Water Agencies
• California Wastewater Process Optimization • Water Infrastructure and System Efficiency
Dairies and Other Ag
• Dairy and Winery Industry Efficiency Program (DWEIS)
Food Processing
• Comprehensive Food Processing Audit and Resource Efficiency • Process Wastewater Treatment EM Program for Agricultural Food Processing • Industrial Refrigeration Performance Plus

Industrial Third Party Programs

California Wastewater Process Optimization Program (CalPOP)

Implementer: QuEST

CalPOP targets wastewater treatment plants and provides facility audits, engineering assistance, project management support and financial incentives based on potential energy savings. The program helps wastewater treatment facilities optimize their processes to reduce energy usage. CalPOP identifies energy savings opportunities related to surface aeration processes (delivered DO sensors, controls, and training) as well as the optimization of all treatment type equipment and process eligible for IOU incentives.

CalPOP's first program iteration in 2000 focused on wastewater treatment facilities as major energy consumers. Initially it focused on surface aeration optimization -- delivering Dissolved Oxygen sensors, controls, and training. This broadened to include all treatment types and equipment optimization and retrofit.

2016 Strategies and Successes

Due to the program's holistic approach, customers may receive significant benefits in addition to direct energy savings. These include improved and better-documented operations of wastewater treatment processes, improved control systems and identification of demand

response opportunities, benchmarking and other performance metrics that can be used for continuous improvement, and education in diagnostic tools and procedures.

Moving forward, CalPOP looks to continue to improve customer technical support, engagement with the municipal approval process for the various water agencies, and implementation project management.

Energy Efficiency Services for Oil and Gas Production

Implementer: CLEAResult

Energy Efficiency Services for Oil and Gas Production is a turnkey custom measure incentive program designed to deliver reliable and persistent electric savings by educating and assisting oil and gas producers and pipeline operators to take advantage of the latest technologies and processes to improve their operations to save energy and improve efficiency.

2016 Strategies and Successes

This program has been ongoing since 2006 and targets oil and gas producers of all types, providing focused assessments, calculation and documentation support, and financial incentives based on actual energy use reductions, It has convinced a risk-adverse customer base, to adopt changes through education and persistent follow through with customers to implement projects.

The program leveraged a promotional program brochure that served to inform customers of qualifying projects and Energy Efficiency measures, participation process, and incentive amounts to reach out, introduce, stimulate and recruit eligible oil and gas producers to participate. The program also utilized PG&E Account Managers, Trade Allies (equipment vendors), and industry information to create customer contact lists, and participated in industry associations and other forums to reach out to qualifying customers.

The oil industry, with its history of booms and busts, is currently in one of its deepest downturn since the 1990s. Earnings are down for companies that made significant profits in recent years, leading them to suspend drilling operations, sharply cut investment in exploration and production, and reduce non-essential operating budgets. The program will continue the push for adoption of new technologies (e.g. MotorWise™); adjust marketing efforts to focus the communicated benefits of the program on avoided energy costs rather than on available technology, and will identify ways to expedite project commitment approvals so customers can act quickly once a qualified project has been identified.

Heavy Industry Energy Efficiency Program

Implementer: Lockheed Martin Corporation

The Heavy Industry Energy Efficiency Program (HIEEP) identifies and facilitates the implementation of major process-oriented and other EE upgrades for large industrial manufacturing customers and recently added Food Processing facilities in the Central Valley.

2016 Strategies and Successes

The Lockheed Martin Energy (LME) HIEEP program and PG&E have worked collaboratively for years to enhance and streamline process and program flow. Through close collaboration HIEEP, in conjunction with PG&E, have enhanced customer service throughout the PG&E service territory by strategically placing field offices closer to the customer. The opening of the Bakersfield, CA office has resulted in greatly improved timeliness and responsiveness to PG&E's Central Valley customers while at the same time allowing increased collaboration on a variety of energy efficiency projects with both PG&E and the end use customers.

HIEEP has been working very closely with the PG&E Auto DR program and has identified several projects and customers that combine EE and DR into a truly IDSM solution.

In 2016, HIEEP worked closely with PG&E to understand, quantify and qualify projects that complied with the Commission Staff guidance. HIEEP expects 2017 to be just as successful as more and more opportunity is realized with the expanded NAICS codes into Central Valley Food Processors

Industrial Refrigeration Performance Plus Program (IRPP)

Implementer: VaCom Technologies

IRPP targets refrigerated warehouses, food processors and related cooling operations that operate year-round or seasonally in the food and beverage sector, including processing, storage and distribution operations with industrial refrigeration systems. Under IRPP, existing facilities are retrofitted, emphasizing refrigeration system improvements as well as envelope, pumping, air handling and related process equipment. Whole-facility simulation is used to quantify savings and economics. Two years of web-based automated performance monitoring and associated operator education is included to provide transparency and long-term permanence of savings. IRPP provides more complex, comprehensive integrated solutions, higher savings levels and institutes a continuous improvement paradigm delivered through real-time performance monitoring and advisory services.

2016 Strategies and Successes

The program is offering Monitored Based Commissioning (MBCx) as a method to obtain energy savings that would be otherwise overlooked. MBCx projects may have a very short payback period and may appeal to customers without incentives. Program's implementation staff is concentrating on engineering sales to substantiate proposed projects and close deals.

Industrial Retrocommissioning Program

Implementer: Nexant, Inc.

The Industrial Retrocommissioning Program (IRCx) targets the heavy industry, manufacturing and food processing sectors and generates energy savings by helping PG&E customers optimize their manufacturing processes by systematically studying low-profile energy losses that commonly occur in manufacturing facilities.

2016 Strategies and Successes

Because of the unique nature of each manufacturing and food processing plants, the IRCx Program facilitates the delivery of audits, and if needed, implementation, by subject matter experts in these types of specific disciplines. The program's consultants and service providers allow the program to provide industries with the most comprehensive energy solutions available from their utility.

Instead of focusing on a small part of the equipment, the IRCx program optimizes whole system operations, achieving deep energy savings for the customer. For example, this includes enhancing the control systems to allow the customer a more transparent operation of their system, so that they can monitor the system and maintain the energy savings level in the future.

The IRCx Program is the first of its kind in PG&E's service territory. It serves the industrial manufacturing sector and commercial processing facilities and built-in requirements designed to promote savings persistence. For some implemented measures the maintenance plan can consist of either a computerized maintenance management system or a multi-year contract with

a preventive maintenance contractor (typically three years) or purchasing equipment to review the operation of the system and training personnel on how to use this equipment.

The IRCx program has begun developing projects with biotech and hi-tech customers focusing on their process cooling systems. These are new type of projects for the program with exciting energy saving potential for these customers which have been underserved in the past.

Industrial Compressed Air System Efficiency Program (ICASE)

Implementer: AALD

The ICASE Program was selected as innovative program for IDEEA 365 solicitation process. The program targets industrial customers with large (>100 hp) compressed air and vacuum systems, promotes and installs state-of-the art control and data monitoring system iZ. Compressed air and vacuum systems are dynamic systems that are constantly changing and deteriorate very quickly when not closely monitored. iZ automation system allows to remotely support and assist customers with keeping efficiencies that have been initially gained by implementing EE project.

2016 Strategies and Successes

The program developed outreach process to provide extensive education to local account representatives and engineering staff about advantages, features and capabilities of the new iZ control system. In parallel Program staff conducted comprehensive market research to justify acceptance of proposed control systems over others existing on the market. ICASE is concentrating on targeting compressed systems based on centrifugal compressors as higher energy efficiency potential.

Refinery Energy Efficiency Program (REEP)

Implementer: Nexant

REEP educates key stakeholders on energy efficient practices in refineries and assists our largest refinery customers in developing and implementing EE projects in PG&E's territory. Nexant brings specialized expertise in refinery engineering and construction to analyze energy efficiency options available to our highly sophisticated customers.

2016 Strategies and Successes

During 2016, Nexant focused on the introduction of new energy efficient technologies including advanced compressor capacity controls and ceramic furnace coatings. Nexant has also focused on other more standard controls which have typically met with resistance at refineries, and successfully installed one of these projects in 2016.

REEP faced several challenges throughout 2016 which contributed to the program not delivering a large portion of its project pipeline. These challenges include declines in oil prices, tightening of environmental regulation, and ongoing challenges with the timing of project review and approval in conjunction with the customer's project schedule.

Seeing the gradual decline in performance year over year, along with PG&E's strong relationship with these large customers, a decision was made to close the REEP program at the end of 2016. This decision will enable PG&E to refine targeting strategies and guide market participants through a design that will ensure cost-effective, reliable energy savings in the future.

A transition plan has been instituted to facilitate the completion of existing projects in Nexant's pipeline and aid the transition of project development to PG&E's field engineering staff.

Small Petrochemical Energy Efficiency Program (SPEEP)

Implementer: CB&I

CB&I's SPEEP program was selected in 2016 through an IDEEA 365 solicitation, designed to deliver turnkey energy efficiency services to underserved and hard to reach customers in PG&E's refinery and petrochemical markets. The Program targets refineries in the southern portion of the PG&E service territory, and smaller and medium sized oil and petrochemical customers throughout PG&E territory. The program offers custom and deemed retrofit, as well as industrial retrocommissioning project services, and utilizes strategic energy management (SEM) planning approaches and tools to develop and implement strategies and projects.

2016 Strategies and Successes

Since launching in 2016, SPEEP has conducted market outreach to targeted customers, has completed a SEM plan and is in the process of developing others, and has initiated development of various gas and electric projects with three companies. CB&I submitted the first program project by year end, which was a large gas-saving project, committed in 2017.

Because SPEEP targets smaller and mid-sized customers, the program is working closely with the Mid-Market account team to target customers and develop a marketing and outreach campaign. Also, the program is raising customer awareness of particular sun-setting measures as a way to create a sense of urgency and initiate program services and SEMP assessments.

High priority project opportunities include Steam Trap Replacement, Lighting Replacement (interior/exterior), Pump VSD Control, Cooling tower VSD Control, High efficiency motor, Compressor VSD, and Insulation Upgrade, among others.

Water Infrastructure System Efficiency Program

Implementer: Lincus

The Water Infrastructure System Efficiency (WISE) Program focuses on the energy optimization of water and wastewater systems in California. The program targets comprehensive system optimization by targeting component improvements first and then optimizing the system as a whole through measures such as pump sequencing and system optimization through hydraulic modeling.

2016 Strategies and Successes

Launched in February 2014, the WISE Program has continued to develop water system benchmarks, project prioritization lists, and energy audits to demonstrate cost-effective EE opportunities with customers. In addition, the WISE program has evaluated energy intensities of various water system components and the embedded energy in customer water and wastewater systems through Water Energy Nexus reports. The program targeted system optimization projects aimed at long term EE improvements.

Customers who enrolled in the program and implemented their first projects in 2016 continued working with WISE identifying new opportunities in all aspects of energy efficiency implementation.

Most water and wastewater customers show tremendous opportunities to reduce the energy consumption of their systems. Although customers operate effective, reliable and safe water systems, little emphasis is put on energy efficiency of their systems. Through the technical support and incentives provided through the WISE program, enrolled customers are identifying

cost effective opportunities to meet their customer demands while reducing energy use. Furthermore, depending on the embedded energy of their system, water conservation measures may yield significant energy savings as well. Since WISE has been extended, the program will continue to work with new and existing customers to develop long term system transformation projects that will include pump efficiency improvement projects, pump sequencing optimization, water system optimization through the use of hydraulic models, among other comprehensive energy efficiency measures.

The Water Infrastructure and System Efficiency Program offers no-cost services designed to assist water and wastewater customers in identifying energy efficiency projects and securing incentives to help offset installation costs. Additionally, the Water Energy Nexus component will study existing integrated water-energy resource management to identify opportunities for improving water systems to reduce energy costs.

Food Processing Program

Implementer: CLEAResult

The Food Processing Program is a comprehensive program designed to assist food processing customers to identify plant-wide electric and gas energy savings opportunities by providing technical assistance to quantify energy savings, and help with the application process to provide cash incentives that encourage implementation of EE projects.

A primary program challenge has been the barrier to entry for customers pursuing calculated projects. The length of the pre-approval cycle has increased significantly to a level where it is discouraging participation and installation of energy efficiency projects.

2016 Strategies and Successes

CLEAResult's comprehensive program approach encourages deep savings and long-term engagement from many customers, as food processors have diverse operations with multiple opportunities for energy efficiency measures.

In 2016 the program focused on marketing through direct outreach to customers, working closely with PG&E account representatives, and educating equipment vendors about eligible measures as applied to their equipment and services. The program also utilized Industry associations and other forums such as the California League of Food Processors (CLFP) to reach out to qualifying customers.

To help customers overcome the challenges of a long pre-approval cycle, CLEAResult and PG&E have worked closely throughout 2016 to improve quality and documentation of calculated projects.

Agriculture and Food Wastewater Energy Program (WEP)

Implementer: BASE Energy, Inc

The Agriculture and Food Wastewater Energy Program (WEP) helps customers in agriculture, food processing, and beverage processing facilities pursue energy efficiency and water conservation projects that yield energy savings in wastewater treatment.

Through the Wastewater Energy Program, BASE provides:

- Economic and engineering feasibility studies for potential projects
- Assistance in project design and implementation to ensure long term energy savings
- Calculated customer incentives to partially offset capital costs

In 2016, key challenges included marketing and a low volume of relatively large projects, which concentrated risk and decreased predictability of results throughout the year.

2016 Strategies and Successes

BASE has partnered with PG&E's Business Energy Services representatives to increase customer engagement in both new and existing projects. Outreach and marketing efforts have included leveraging the California League of Food Processors (CLFP) and associated trade conventions.

Agricultural Third Party Programs

Dairy and Winery Industry Efficiency Program (DWIES)

Implementer: CLEAResult

The Program provides a comprehensive approach to assisting dairy, winery and brewery customer's identify and evaluate the energy saving opportunities and then facilitates customer action.

The objective of the Coordination Activities is to identify all parties which have programs related to the Dairy and Winery Industry Efficiency Solutions Program and to develop a strategy that minimizes customer confusion, avoids duplication of services or costs, and identifies synergistic opportunities. Two previously implemented programs by CLEAResult for dairies and wineries were combined into the DWIES program to improve the economics of program implementation.

DWIES Saves Energy by Keeping Our Cows and Milk Cool

The Unitary Fluid Cooler refrigeration systems upgrade at a dairy continued in 2016. DWIES was highly involved in training as customers and their vendors were not familiar with opportunity. One project for a 2000 cow dairy achieved total water savings associated with installed project at 41 MGal/year with an additional 196,000 kWh of electricity savings.

Strategies and Successes

Refrigeration system upgrades remain the single largest opportunity for achieving energy savings at dairy sites. In 2016, it was discovered that customers had faced challenges to installing refrigeration system upgrade recommendations due to vendor lack of knowledge and supply chain issues. Subsequently DWIES developed and held a meeting to train refrigeration vendors on the program process, documentation requirements and the details of the program recommendations. This event also included manufacturers of key refrigeration components to help bridge the gaps between program recommendations and customer ability to install high energy and water saving measures. As follow up, the program issued a monthly newsletter to refrigeration vendors to keep them engaged and assigned dedicated staff to vendor outreach. This led to a significant increase in the number of refrigeration projects added to the program forecast and a tripling of refrigeration vendors engaging the program.

OBF is promoted and has been well received by this market. Dairy farmers have leveraged OBF as a resource to ensure that projects move forward. The greatest success continued to be the close working relationship between DWIES and PG&E account managers who manage dairy accounts, where customer needs are shared and strategies are developed jointly to maintain a high level of customer service.

There is significant energy and water savings potential with real opportunity for water/energy nexus work. Thus, in 2016 implementing specific water/energy saving measures for 4 projects, the program estimated 213,398,400 gallons per year in water savings.

Tables

Section 1
Energy Savings

Table 1.
Electricity and Natural Gas Savings and Demand Reduction (Gross)

Annual Results		2016 Installed Savings (2)	CPUC 2016 Adopted Goals (D.15-10-028) (3)	% of Goals (2016) (4)
2016 Energy Savings (GWh) – Annual (1)		***1,406***	***1,236***	***114%***
	PG&E	1,406	1,236	114%
	SCE			
	SDG&E			
	SCG			
	MCE			
	Bay REN			
	SoCal REN			
TOTAL Energy Savings (GWh) - Annual (5)		**1,406**	**1,236**	**114%**
2016 Energy Savings (GWh) – Lifecycle		***31,161***		
	PG&E	31,161		
	SCE			
	SDG&E			
	SCG			
	MCE			
	Bay REN			
	SoCal REN			
TOTAL Energy Savings (GWh) – Lifecycle (6)		**31,161**		
2016 Natural Gas Savings (MMth) – Annual (1)		***23.59***	***18.4***	***128%***
	PG&E	24	18.4	128%
	SCE			
	SDG&E			
	SCG			
	MCE			
	Bay REN			
	SoCal REN			
TOTAL Natural Gas Savings (MMth) – Annual (5)		**23.59**	**18.40**	**128%**

2016 Natural Gas Savings (MMth) – Lifecycle		***387***		
	PG&E	387		
	SCE			
	SDG&E			
	SCG			
	MCE			
	Bay REN			
	SoCal REN			
TOTAL Natural Gas Savings (MMth) – Lifecycle (6)		**387**		
2016 Peak Demand savings (MW) (1)		***292***	***226***	***129%***
	PG&E	292	226	129%
	SCE			
	SDG&E			
	SCG			
	MCE			
	Bay REN			
	SoCal REN			
TOTAL Peak Demand savings (MW) (5)		**292**	**226**	**129%**

(1) All annual energy savings numbers are on a gross basis except Codes and Standards (C&S), which are net with 5% market spillover. Energy savings are based on the actual accomplishments recorded in 2016.

(2) Installed savings for PG&E includes Energy Savings Assistance (ESA) Program; Bay Area Regional Energy Network (Bay REN and Marin Clean Energy (MCE) as reported in their 2016 Annual Report, filed on April 20, 2017.

(3) 2016 Adopted Goals for MCE and Bay REN are not available and have been intentionally left blank.

(4) 2016 % of Goals for MCE and Bay REN are not available and have been intentionally left blank.

(3) The Total Savings reported on this table represent the gross program savings and include C&S which are reported on a net basi with 5% market spillover.

(4) Lifecycle savings include C&S gross lifecycle savings.

Section 2
Emission Reductions

Table 2

Environmental Impacts (Gross) (2) (3)

Annual Results	Annual tons of CO2 avoided	Lifecycle tons of CO2 avoided	Annual tons of NOx avoided	Lifecycle tons of NOx avoided	Annual tons of SOx avoided[1]	Lifecycle tons of SOx avoided[1]	Annual tons of PM10 avoided	Lifecycle tons of PM10 avoided
2016Portfolio Targets	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
PG&E	1,575,800	17,379,821	296	3,616	-	-	93	995
2016 Total	**1,575,800**	**17,379,821**	**296**	**3,616**	**-**	**-**	**93**	**995**

(1) The avoided SOX reductions are not calculated in the cost effectiveness tool (CET.) It was determined that none of the IOUs uses coal power on the margin and the energy efficiency savings have impact on the margin only.

(2) Environmental Impacts in this table may not match the CET results from PG&E's CEDARS data submission. Current table includes minor additional savings of 1.8 MW, 7.1 GWh, 0.67 MMth for claims with no implementation_id which is less than 1% of the total portfolio GWh energy savings.

(3) Excludes Energy Savings Assistance (ESA) Program, BayREN, and MCE.

Section 3
Expenditures

Table 3

All expenditure data can be found in the attached "PGE.AnnualExcel.2016.1.xlsx" spreadsheet, under Tab "T-3 Exp's".

Section 4
Cost-Effectiveness

Table 4

Cost Effectiveness (Net) (5)

Annual Results	Total Cost to Billpayers (TRC) (3)	Total Savings to Billpayers (TRC)	Net Benefits to Billpayers (TRC) (3)	TRC Ratio (4)	Total PAC Cost (3)	PAC Ratio (4)	PAC Cost per kW Saved ($/kW) (1)	PAC Cost per kWh Saved ($/kWh) (2)	PAC Cost per therm Saved ($/therm) (2)
PG&E 2016	$ 951,436,903	$ 1,418,844,352	$ 467,407,449	1.49	$ 418,193,570	3.39		0.02	0.14
PG&E TOTAL	**$ 951,436,903**	**$ 1,418,844,352**	**$ 467,407,449**	**1.49**	**$ 418,193,570**	**3.39**	**$ -**	**0.02**	**0.14**

(1) The adopted avoided cost methodology does not provide information to provide a meaningful value for PAC Cost per kW.
The adopted avoided cost methodology created kWh costs values that vary for each hour of the year that includes kW generation

(2) PAC cost per kWh or per therm is PAC cost per annual discounted net kWh or annual discounted net therm respectively per CET based definition provided by CPUC to PG&E via e-mail on April 8, 2016.

(3) The cost-effectiveness calculations are based on the actual accomplishments recorded in 2016.
Includes:
Includes ESPI payment of $16.3M recorded in 2016 per Resolution E-4807 (D. 13-09-023) , Codes and Standards costs and benefits.
Includes installed savings for Energy Savings Assistance (ESA) Program; program costs for Bay Area Regional Energy Network (BayREN) and Marin Clean Energy (MCE) as reported in their revised December 2016 Monthly Report, filed on April 20, 2017.
Excludes:
Excludes ESA Program costs and benefits, Statewide Emerging Technologies Program costs per D.12-11-015 (p.52).
The Financing Program OBF Loan Pool amounts (loans issued and repaid) of $2.2M for 2016 are excluded per D.09-09-047 (p.288).

(4) All savings values include 5% market spillover in cost-effectiveness calculations per D.12-11-015 (OP 37) including Codes and Standards.

(5) Cost-Effectiveness results in this table may not match the CET results from PG&E's CEDARS data submission. Current table includes minor additional savings of 1.8 MW, 7.1 GWh, 0.67 MMth for claims with no implementation_id which is less than 1% of the total portfolio GWh energy savings.

Section 5
Bill Impacts

A			B	C
Table 5				
Ratepayer Impacts				
2016	**Electric Average Rate (Res and Non-Res) $/kwh**	**Gas Average Rate (Core and Non-Core) $/therm**	**Average First Year Bill Savings ($)**	**Average Lifecycle Bill Savings ($)**
PG&E Average	0.1823	1.4853	257,662,361	2,604,759,808
PG&E Average	**0.1823**	**1.4853**	**257,662,361**	**2,604,759,808**

Notes: (Consistent with SPM TRC/PAC/RIM tests, all savings used from actuals and forecasts in this table are net not gross)
(1) Average first year electric bill savings is calculated by multiplying an average electric rate (as of 3/1/15) with first year net kWh energy savings.
(2) Average first year gas bill savings is calculated by multiplying an average gas rate (as of 1/1/15) with first year net therm energy savings.
(3) Total average first year bill savings is the sum of Notes 1 and 2.
(4) Average lifecycle electric bill savings is calculated by multiplying an average electric rate with lifecycle net kWh energy savings.
(5) Average lifecycle gas bill savings is calculated by multiplying an average gas rate with lifecycle net therm energy savings.
(6) Total average lifecycle bill savings is the sum of Notes 4 and 5.
(7) Total Average Bill Savings by Year and Lifecycle Bill Savings include C&S net savings and net lifecycle savings respectively; and excludes ESA Program, BayREN and MCE savings.

Section 6
Savings by End Use

Table 6

Annual Savings By End-Use 2016 Only (1) (2)

	GWH	% of Total	MW	% of Total	MMTh = 1,000,000 therms	% of Total
Residential	**255.27**	**18.15%**	**60.19**	**20.60%**	**4.73**	**20.03%**
Appliances	4.22	0.30%	0.68	0.23%	0.14	0.58%
Consumer Electronics	-	0.00%	-	0.00%	-	0.00%
Cooking Appliances	-	0.00%	-	0.00%	-	0.00%
HVAC	15.78	1.12%	16.36	5.60%	0.01	0.04%
Lighting	71.94	5.12%	10.36	3.54%	(1.34)	-5.68%
Pool Pump	9.38	0.67%	1.33	0.46%	-	0.00%
Refrigeration	-	0.00%	-	0.00%	-	0.00%
Water Heating	0.85	0.06%	0.18	0.06%	0.30	1.28%
Other	153.10	10.89%	31.28	10.71%	5.62	23.81%
Nonresidential	**393.32**	**27.97%**	**83.58**	**28.60%**	**7.89**	**33.45%**
HVAC	61.70	4.39%	11.51	3.94%	4.26	18.04%
Lighting	155.89	11.09%	30.34	10.38%	(0.88)	-3.73%
Office	1.21	0.09%	0.02	0.01%	(0.01)	-0.03%
Process	120.83	8.59%	28.84	9.87%	3.73	15.83%
Refrigeration	18.39	1.31%	2.76	0.94%	0.30	1.29%
Water Heating	-	0.00%	-	0.00%	-	0.00%
Other	35.30	2.51%	10.12	3.46%	0.48	2.05%
Low Income Energy Efficiency	**26.46**	**1.88%**	**5.35**	**1.83%**	**1.56**	**6.62%**
Codes & Standardss Energy Savings	**731.06**	**51.99%**	**143.08**	**48.97%**	**9.41**	**39.90%**
PG&E ANNUAL PORTFOLIO SAVINGS (2016) (3)	**1,406.11**	**100.00%**	**292.19**	**100.00%**	**23.59**	**100.00%**

(1) All energy savings numbers are on a gross basis except Codes and Standards are net with 5% market spillover.
(2) Includes savings for ESA Program; BayREN and MCE savings as reported in their 2016 Annual Report filed on April 20, 2017.
(3) The Total Savings reported on this table represent the gross program savings and include C&S which are reported on a net basis with 5% market spillover

Section 7
Commitments

Table 7

Commitments [4]

Commitments Made in the Past with Expected Implementation after December 2010-2012				
	Committed Funds [1]	Expected Energy Savings		
2010-2012[1]	$	GWH	MW	MMth
PG&E Total	N/A	N/A	N/A	N/A

Commitments Made in the Past Year with Expected Implementation after December 2015				
	Committed Funds[2]	Expected Energy Savings		
2013-2015[2]	$	GWH	MW	MMth
PG&E Total	N/A	N/A	N/A	N/A

Commitments Made in the Past Year with Expected Implementation after December 2016				
	Committed Funds [3]	Expected Energy Savings		
2016[3]	$	GWH	MW	MMth
PG&E Total	$ 48,833,978	197.5	62.2	15.42

[1] **Note: Committed funds are associated with the 2010-2012 program cycle. These funds are reserved or encumbered for future work permitted per Ordering Paragraph 13 and Conclusion of Law 12 of D.12-11-015.**
PG&E notes that the 2016 Commitments table layout has changed compared to 2013-15 template.
Since commitments are a snapshot at a given point in time and vary, PG&E has not recorded the detail requested in footnotes #1 of the new template for 2010-12. For this reason, the 2010-2012 Committed Funds have been left blank. PG&E can only provide this information moving forward.

[2] **Note: Committed funds are associated with the 2013-2015 program cycle. These funds are reserved or encumbered for future work permitted per the EESTATS CPUC Guidence Document and EE decision (D.15-10-025)**
PG&E notes that the 2016 Commitments table layout has changed compared to 2013-15 template.
Since commitments are a snapshot at a given point in time and vary, PG&E has not recorded the detail requested in footnotes #2 of the new template for 2013-15. For this reason, the 2013-2015 Committed Funds have been left blank. PG&E can only provide this information moving forward.

[3] **Note: Committed funds are associated with the 2016 program year. These funds are reserved or encumbered for future work permitted per the EESTATS CPUC Guidence Document and EE decision (D.15-10-0**
Committed Funds include incentives related to PG&E EE projects committed in prior year(s) but not completed by December 2016.

[4] Note: All energy savings numbers are on a gross basis.

Section 8
Shareholder Performance Incentives

2016 requested and approved shareholder earnings are from EE activities performed in program years 2014 and 2015.

The mechanism and payment associated with 2015 program activities was based on the Efficiency Savings and Performance Incentive (ESPI) mechanism as approved in D.13-09-023. The ESPI mechanism is a multi-component incentive structure. The ESPI mechanism was established with the goal and objective to encourage and motivate IOUs to invest in energy efficiency programs that are quantifiable, as well as other non-quantifiable programs that help transform the market. The four components contributing to 2015 ESPI earnings are:

1. **Component 1**: A performance award for energy savings of up to 9% of the resource program budget (excluding codes and standards program budgets),
2. **Component 2:** A performance award for ex ante review activities of up to 3% of resource program budget (excluding codes and standards program budgets),
3. **Component 3:** A management fee for codes and standards (C&S) programs of up to 12% of codes and standards program budgets, and
4. **Component 4:** A management fee for non-resource programs of up to 3% of non-resource program budgets.

PG&E filed an Advice Letter on September 1, 2016 requesting an award for certain EE Program Year 2014 and 2015 activities including custom projects, uncertain measures, and a true-up of the 2014 incentive payment.

The earnings requested in 2016 were approved in Resolution E-4807 in response to PG&E's Advice Letters Advice Letters 3755-G/4908-E and 3755-G-A/4908-E-A, per direction from D.13-09-023. The table below provides the final payment awarded to PG&E for program years 2014 and 2015.

The final shareholder incentive payment was impacted by the 2006-2008 RRIM Adjustment, which deducted $5.8 million from the final incentive payment.

Program Year for Activities Paid	Year Incentive Requested and Approved	Authorizing Decision	Shareholder Incentive
2013	2016	Resolution E-4807	$13.66M
2014	2016	Resolution E-4807	$8.6M
2006-2008 RRIM Adjustment	2016	Resolution E-4807	-$5.8M

Appendices

Appendix A

PG&E Program ID Numbers

Program ID	Program Name	Date Added (new programs)	Date Removed
PGE2100	Residential Energy Efficiency Program		
PGE21001	Residential Energy Advisor		
PGE210011	Residential Energy Fitness	06/01/2016	
PGE21002	Plug Load and Appliances		
PGE21003	Multifamily Energy Efficiency Rebates Program		
PGE21004	Energy Upgrade California™ Home Upgrade		
PGE21005	Residential New Construction		
PGE21006	Residential HVAC		
PGE21007	California New Homes Multifamily		
PGE21008	Enhanced Time Delay Relay		
PGE21009	Direct Install for Manufactured and Mobile Homes		
PGE2101	Commercial Program		
PGE21011	Commercial Calculated Incentives		
PGE210112	School Energy Efficiency		
PGE210118	Retail Energy Efficiency		
PGE210119	Light Emitting Diode (LED) Accelerator		
PGE21012	Commercial Deemed Incentives		
PGE210123	Healthcare Energy Efficiency Program		
PGE210126	K-12 Private Schools and Colleges Audit Retrofit		
PGE210127	Innovative Designs for Energy Efficiency Approaches (IDEEA)		
PGE210128	Enovity AERCx		09/01/2016
PGE210129	Nexant ERCx		09/01/2016
PGE21013	Commercial Continuous Energy Improvement		
PGE210135	Water Infrastructure and System Efficiency		
PGE210137	Waypoint Commercial Outreach		
PGE210138	Data Center Air Flow and Temp Optimization		
PGE210139	Energize Schools		
PGE21014	Commercial Energy Advisor program		
PGE210141	Lincus Commercial Mid-Market		3/31/2016
PGE210143	Hospitality Program	1/1/2016	
PGE21015	Commercial HVAC		
PGE21017	Boiler Energy Efficiency Program		
PGE21018	EnergySmart Grocer		
PGE2102	Industrial Program		
PGE21021	Industrial Calculated Incentives		
PGE210210	Industrial Retrocommissioning		
PGE210211	Light Industrial Energy Efficiency		
PGE210212	Compressed Air and Vacuum Optimization		

Program ID	Program Name	Date Added (new programs)	Date Removed
PGE210213	Small Petrochemical Energy Efficiency		
PGE21022	Industrial Deemed Incentives		
PGE21023	Industrial Continuous Energy Improvement		
PGE21024	Industrial Energy Advisor Program		
PGE21025	California Wastewater Process Optimization		
PGE21026	Energy Efficiency Services for Oil Production		
PGE21027	Heavy Industry Energy Efficiency Program		
PGE21029	Refinery Energy Efficiency Program		
PGE2103	Agricultural Program		
PGE21030	Industrial Strategic Energy Management		
PGE21031	Agricultural Calculated Incentives		
PGE210311	Process Wastewater Treatment Energy Management (EM) Program for Agricultural Food Processing		
PGE210312	Dairy and Winery Industry Efficiency Solutions	3/24/2016	
PGE21032	Agricultural Deemed Incentives		
PGE21033	Agricultural Continuous Energy Improvement		
PGE21034	Agricultural Energy Advisor Program		
PGE21036	Industrial Refrigeration Performance Plus		
PGE21039	Comprehensive Food Process Audit & Resource Efficiency Program		
PGE2104	Lighting Program		
PGE21041	Primary Lighting		
PGE21042	Lighting Innovation		
PGE21023	Lighting Market Transformation		
PGE2105	Codes and Standards		
PGE21051	Building Codes Advocacy		
PGE21052	Appliance Standards Advocacy		
PGE21053	Compliance Improvement		
PGE21054	REACH Codes		
PGE21055	Planning and Coordination		
PGE21056	Code Readiness	1/1/2016	
PGE2106	Emerging Technologies Program		
PGE21061	Technology Development Support		
PGE21062	Technology Assessments		
PGE21063	Technology Introduction Support		
PGE2107	Workforce Education and Training		
PGE21071	Centergies		
PGE21072	Connections		
PGE21073	Strategic Planning		
PGE2108	Statewide DSM Coordination & Integration		
PGE21081	Statewide DSM Coordination & Integration		
PGE2109	Financing		
PGE21091	On-Bill Financing		
PGE21092	Third-Party Financing		
PGE21093	New Financing Offerings		

Program ID	Program Name	Date Added (new programs)	Date Removed
PGE210931	Fin Plt: Residential Energy Efficiency Loan Assistance Program (REEL, formerly SFLP)		
PGE210932	Fin Plt: Energy Financing Line Item Charge		
PGE210933	Fin Plt: Master-Metered Multifamily Financing Pilot		
PGE210934	Fin Plt: OBR Small Business Lease Providers Pilot		
PGE210935	Fin Plt: OBR Small Business Loan Pilot		
PGE210936	Fin Plt: Off-Bill Small Business Lease Providers Pilot		
PGE210937	Fin Plt: On Bill Repayment (OBR) for Medium and Large Business		
PGE2110	Government Partnership Programs		
PGE2110011	California Community Colleges		
PGE2110012	University of California/California State University		
PGE2110013	State of California		
PGE2110014	Department of Corrections and Rehabilitation		
PGE2110051	Local Government Energy Action Resources (LGEAR)		
PGE2110052	Strategic Energy Resources		
PGE211007	Association of Monterey Bay Area Governments (AMBAG)		
PGE211009	East Bay		
PGE211010	Fresno		
PGE211011	Kern		
PGE211012	Madera		
PGE211013	Marin County		
PGE211014	Mendocino/Lake County		
PGE211015	Napa County		
PGE211016	Redwood Coast		
PGE211018	San Luis Obispo County		
PGE211019	San Mateo County		
PGE211020	Santa Barbara		
PGE211021	Sierra Nevada		
PGE211022	Sonoma County		
PGE211023	Silicon Valley		
PGE211024	San Francisco		
PGE211025	Savings by Design		
PGE211026	North Valley	09/01/2016	
PGE211027	Sutter-Butte	09/01/2016	
PGE211028	Yolo	09/01/2016	
PGE211029	Solano	09/01/2016	
PGE211030	Northern San Joaquin Valley	09/01/2016	
PGE211031	Valley Innovative Energy Watch (VIEW)	09/01/2016	

Appendix B

Regulatory Decisions, Rulings and Advice Letters

The following EE-related rulemakings, decisions and resolutions were issued by the CPUC, informing EE activities in 2016.

EE Rulemaking Phase I

In 2014, the Commission completed Phase I of the *Order Instituting Rulemaking Concerning Energy Efficiency Rolling Portfolios, Policies, Programs, Evaluation and Related Issues* (R.13-11-005) that was issued on November 21, 2013. Phase I focused on approving EE funding and portfolios for 2015. PG&E filed its *Energy Efficiency 2015 Funding Proposal* on March 26, 2014. On October 24, 2014, the Commission issued approved D.14-10-046: *Decision Establishing Energy Efficiency Savings Goals and Approving 2015 Energy Efficiency Programs and Budgets*.

The Phase I Decision, as corrected by D.15-01-002 and D.15-01-023, approved PG&E's total 2015 EE portfolio budget of $430.1 million, including $379.3 million for PG&E's program budget, $16.8 million for EM&V, $12.8 million for BayREN's EE programs, and $1.2 million for MCE's EE programs. The Phase I Decision also approved PG&E's request for $3.3 million for 2015 DR funding for IDSM.

The Phase I Decision (at pp. 30-32) determined that 2015 is the third year of a 2013-2015 portfolio cycle, allowing the IOUs and RENs to use unspent 2013-2014 funds in 2015, to count savings from 2013-2014 towards 2015 goals and cost effectiveness, and to calculate regulatory caps and targets. The Commission directed Staff to undertake EM&V activities for 2013-2014 and 2015 combined.

The Phase I Decision (at OP 21 and pp. 31-32) leaves the 2015 programs and funding in place until the earlier of when the Commission provides superseding direction, or 2025.

The Phase I Decision (at OP 16) required the IOUs and MCE to file Tier 2 advice letters within 60 days to reflect the budget adjustments adopted in the decision, including recalculated TRC and PAC test results exceeding a 1.0 threshold for 2015. PG&E filed this advice letter on December 15, 2014, with superseding supplemental advice letters in 2015, as detailed below. The Phase I Decision also required a number of other advice letters to be filed in 2015.

EE Rulemaking Phase IIa

On February 24, 2015, the Commission issued the Scoping Memorandum for Phase II of this proceeding. Based on prehearing conference statements from the parties involved, the Commission identified three broad categories of items to address in Phase II: (1) developing "Rolling Portfolio" review processes; (2) providing guidance on changes for 2016 portfolios; and (3) updating various portfolio metrics (e.g., Database for Energy Efficiency Resources (DEER) values) to keep portfolios on course through 2016 and beyond.

On October 28, 2015, the Commission issued D.15-10-028: Decision Re Energy Efficiency Goals for 2016 and Beyond and Energy Efficiency Rolling Portfolio Mechanics. (Phase IIa Decision). In this decision, the Commission adopted energy savings goals for EE portfolios from 2016 to 2024; established a "Rolling Portfolio" process for reviewing and revising portfolios; and

updated various energy efficiency program portfolio metrics, including Database of Energy Efficient Resources values.

EE Rulemaking Phase IIb

On August 25, 2016, the Commission issued D.16-08-019: Decision Providing Guidance for Initial Energy Efficiency Rolling Portfolio Business Plan Filings. (Phase IIb Decision). In this decision, the Commission set forth policy guidance on several issued related to the filing of energy efficiency business plans, as previously contemplated in D.15-10-028. The decision also addressed next steps for regional energy networks, the appropriate baselines to be used to measure energy savings for specific programs and measures, transition for statewide and third-party programs, and changes to the evaluation and shareholder incentive frameworks.

EE Rulemaking Phase III

On November 2, 2016, the Commission issued the Scoping Memorandum for Phase III of this proceeding. The Commission acknowledged that this proceeding was already well underway when Senate Bill (SB) 350 (2015) and Assembly Bill (AB) 802 (2015) both became law, creating a significant impact on the Commission's oversight of energy efficiency programs and policy. The key provisions of SB 350 for energy efficiency include a goal of doubling the amount of energy efficiency savings in California by 2030, with emphasis on market transformation and pay-for-performance approaches, among other things. AB 802's provisions primarily affect the manner in which baselines are set for measuring energy savings towards goals. All of these topics were covered, to some degree, in D.16-08-019. However, two specific areas warrant additional policy development in Phase III: (1) market transformation, as discussed in SB 350 and (2) custom projects, particularly in the industrial sector, as discussed in D.16-08-019.

This proceeding is still the ongoing venue for any policymaking related to energy efficiency. The ongoing policy issues identified including: updates to DEER and EE potential and goals; updates to the EE Strategic Plan; updates to the EM&V framework; the role of the California Technical Forum; updates to the ESPI mechanism; updates to the cost-effectiveness framework for energy efficiency, in coordination with the integrated distributed energy resource (IDER) rulemaking (R.14-10-003); coordination with statewide marketing, education, and outreach efforts; approached for evaluations using normalized metered energy consumption and/or dynamic baselines; and Industry Standard Practice determinations.

Advice Letters

PG&E filed the following advice letters related to EE in 2016.

1) California Energy Efficiency Coordinating Committee Meeting Plans and Budget for Program Year 2016, filed January 29, 2016
http://www.pge.com/nots/rates/tariffs/tm2/pdf/GAS_3681-G.pdf

2) Supplemental: Request For Authority for Retail Products Platform (RPP) Pilot within PG&E's Residential Energy Efficiency Plug-Load and Appliances Sub-Program, filed February 10, 2016
http://www.pge.com/nots/rates/tariffs/tm2/pdf/GAS_3668-G-A.pdf

3) Submission of High Opportunity Projects and Programs (HOPPs) Proposal - Residential Pay-for-Performance Program, filed March 25, 2016
http://www.pge.com/nots/rates/tariffs/tm2/pdf/GAS_3698-G.pdf

4) Submission of High Opportunity Projects and Programs (HOPPs) Proposal - On-Bill Financing Alternative Pathway Program, filed March 25, 2016
http://www.pge.com/nots/rates/tariffs/tm2/pdf/GAS_3697-G.pdf

5) Request Authority to Increase Incentive Funds Available to the San Francisco Bay Area Regional Energy Network's Single Family "Home Upgrade" Energy Efficiency Program, filed April 19, 2016
http://www.pge.com/nots/rates/tariffs/tm2/pdf/GAS_3704-G.pdf

6) Pacific Gas and Electric Company's Request for Approval to Reduce Incentive Levels for Lighting Measures Offered in its Statewide Non-Residential Energy Efficiency Programs, filed May 26, 2016
http://www.pge.com/nots/rates/tariffs/tm2/pdf/ELEC_4848-E.pdf

7) Pacific Gas and Electric Company's Request for Approval to Return Prior Years Unspent Energy Efficiency Funds, filed June 8, 2016
http://www.pge.com/nots/rates/tariffs/tm2/pdf/GAS_3718-G.pdf

8) Supplemental: Submission of High Opportunity Projects and Programs (HOPPs) Proposal - On-Bill Financing Alternative Pathway Program, filed June 10, 2016
http://www.pge.com/nots/rates/tariffs/tm2/pdf/GAS_3697-G-A.pdf

9) Pacific Gas and Electric Company's Request for Approval to Assign Subprogram Designations to Six Existing Local Government Partnerships (LGPs), filed on July 13, 2016
http://www.pge.com/nots/rates/tariffs/tm2/pdf/GAS_3737-G.pdf

10) Request for Approval of PG&E's Assembly Bill 793 Implementation Plan, filed August 1, 2016
http://www.pge.com/nots/rates/tariffs/tm2/pdf/GAS_3744-G.pdf

11) Request For Authority to Shift Energy Efficiency Funds in 2015 and 2016, filed August 31, 2016
http://www.pge.com/nots/rates/tariffs/tm2/pdf/GAS_3752-G.pdf

12) Request of Pacific Gas and Electric Company for 2014 and 2015 Energy Efficiency Incentive Award, filed September 1, 2016
http://www.pge.com/nots/rates/tariffs/tm2/pdf/GAS_3755-G.pdf

13) PG&E's 2017 Energy Efficiency Annual Budget Advice Letter in Compliance With Decision 15-10-028, Ordering Paragraph 4, filed September 1, 2016
http://www.pge.com/nots/rates/tariffs/tm2/pdf/GAS_3753-G.pdf

14) PG&E's Request for the Cancellation of Plug Load and Appliances (PLA) Subprogram Appliance Recycling Program (ARP), filed September 13, 2016
http://www.pge.com/nots/rates/tariffs/tm2/pdf/GAS_3757-G.pdf

15) Pacific Gas and Electric Company's Request for Approval to Reduce Incentive Levels for Lighting Measures Offered in its Statewide Non-Residential Energy Efficiency Programs, filed September 16, 2016
http://www.pge.com/nots/rates/tariffs/tm2/pdf/ELEC_4917-E.pdf

16) Supplemental: Request For Authority to Shift Energy Efficiency Funds in 2015 and 2016, filed September 21, 2016
http://www.pge.com/nots/rates/tariffs/tm2/pdf/GAS_3752-G-A.pdf

17) Supplemental: PG&E's 2017 Energy Efficiency Annual Budget Advice Letter in Compliance With Decision 15-10-028, Ordering Paragraph 4, filed September 21, 2016
http://www.pge.com/nots/rates/tariffs/tm2/pdf/GAS_3753-G-A.pdf

18) Second Supplemental: Request For Authority to Shift Energy Efficiency Funds in 2016 and 2015, filed September 22, 2016
http://www.pge.com/nots/rates/tariffs/tm2/pdf/GAS_3752-G-B.pdf

19) Supplemental: Request of Pacific Gas and Electric Company for 2014 and 2015 Energy Efficiency Incentive Award, filed October 7, 2016
http://www.pge.com/nots/rates/tariffs/tm2/pdf/GAS_3755-G-A.pdf

20) Supplemental: California Energy Efficiency Coordinating Committee Meeting Plans and Budget for Program Year 2016, filed October 13, 2016
http://www.pge.com/nots/rates/tariffs/tm2/pdf/GAS_3681-G-A.pdf

21) Second Supplemental: California Energy Efficiency Coordinating Committee Meeting Plans and Budget for Program Year 2016, filed November 10, 2016
http://www.pge.com/nots/rates/tariffs/tm2/pdf/GAS_3681-G-B.pdf

22) Supplemental: Pacific Gas and Electric Company's Request for Approval to Reduce Incentive Levels for Lighting Measures Offered in its Statewide Non-Residential Energy Efficiency Programs, filed November 29, 2016
http://www.pge.com/nots/rates/tariffs/tm2/pdf/ELEC_4917-E-A.pdf