

K-12 Energy Efficiency Program

KEEP

Implementation Plan

2021

Program Overview:

K-12 Energy Efficiency Program (KEEP) is a third party delivered program for San Diego Gas & Electric Company (SDG&E) which will deliver high quality measurable savings to public and charter schools through a direct install model. Savings will be claimed using a population Normalized Metered Energy Consumption (NMEC) Measurement and Verification (M&V) approach. The program will be managed and operated by California Retrofit Incorporated (CRI), a local company with extensive experience implementing direct installation programs. A key feature of the KEEP program is the KEEP Concierge, a single point of contact for all questions related to energy efficiency and sustainability. Pertinent Program details are listed in Table 1 below:

TABLE 1:

Program Name	KEEP (K-12 Energy Efficiency Program)
Type of Program (third Party delivered)	Third Party Delivered
Market Sectors	Municipal/ Public
Program Type (resource, non-resource)	Resource
Market Channels	Downstream
Intervention Strategies	Direct Install, Financing, Audit, Installation, Technical Advisement, Population NMEC

Expected program TRC and PAC are presented below in Table 2.

TABLE 2:

	2021	2022	2023	2024
Program TRC	0.89	1.3	1.41	1.49
Program PAC	1.00	1.54	1.67	1.76

Campaign Goals and Timeline are detailed in Table 3.

TABLE 3:

Program Phase	Goal	Dates
Ramp Up	Implementation Plan, Program Data Invoicing and Reporting Training, Marketing Collateral Development	8.18.21-10.18.21
Program Launch	Marketing Plan Implementation, Customer Enrollment, On Going Program Reporting	10.18.21-12.31.21
Program Steady State	Customer Enrollment, Energy Savings	1.1.22-10.31.2024
Program Shut Down	Shut Down Plan	10.31.2024-12.31.24
Post Program	Final Program Report	3.1.25

Program savings and budget are presented below in Table 4.

TABLE 4:

	2021	2022	2023	2024	Total
Net kWh	925,757	3,703,027	3,703,027	3,703,027	12,034,838
Net Therms	6,419	25,676	25,676	25,676	83,447
Net kW	168	485	485	485	1,623
Budget	\$786,280.00	\$ 2,985,350.00	\$ 2,923,528.00	\$ 2,923,528.00	\$ 9,618,686.00

Program Description:

Armed with extensive data from prior Prop 39 school audits, the KEEP team created a list of turnkey measures across HVAC and lighting which will deliver measurable energy savings. The measures that will deliver the most energy savings are provided to schools at no cost, with additional lighting measures provided at a heavily discounted rate from market pricing. Additionally, the KEEP Concierge will be tasked with researching other efficiency opportunities commonly found in schools, such as pool heaters and pumps, and refrigeration

For any out-of-pocket costs, KEEP will assist schools in On Bill Financing enrollment. KEEP’s emphasis on **On-Bill Financing and NMEC** quite reframes the conversation about energy efficiency, from “How much is my rebate?” to

“What are the steps I need to take to maintain consistent returns on my investment over time?”. While it is true that customers can now use either OBF or NMEC, no other program has explicitly paired the two together as a selling point. In the past, projects funded through OBF have used (custom) isolated retrofit or deemed energy savings estimates to calculate the loan repayment amounts and repayment period. OBF loan repayment is intended to be bill-neutral, where the loan is repaid by energy cost savings, but the issue remains that without NMEC there is no metric of statistical confidence that savings will be reliably detected ‘at the meter’ to repay the loan. Therefore, with customers focused on managing savings persistence to repay loans, KEEP promotes proactive and consistent energy management behaviors and establishes long-term relationships with customers. KEEP Partner Recurve’s NMEC analytics platform is designed to improve access to savings performance data for customers, KEEP staff, and ultimately SDG&E. Finally, the OBF loan pool can uniquely be used to capture deep, comprehensive energy efficiency projects. Traditional, single end-use projects have never demonstrated the real value of OBF: by combining no/ low-cost, high-ROI (Return on Investment) measures with higher-cost, low-ROI capital retrofits, KEEP unlocks the full impact of OBF to move K-12 customers beyond ‘low-hanging fruit’ and closer to zero net energy. These new programmatic emphases unlock new operational efficiencies, too, by providing direct solutions to issues such as low NTG (Net to Gross), lower deemed savings values and fewer eligible deemed measures, and the lengthy custom review process.

KEEP’s comprehensive **School Engagement strategy** leverages existing relationships at schools that have been cultivated through other regional education initiatives. KEEP’s partnership with SEI (Strategic Energy Innovations) represents a new approach to building support for energy efficiency. Rather than operate in separate siloes, KEEP uses the communication channels created by SEI between students, teachers, parents, administrators, elected officials, and building operators to market the program, to deliver clear messaging around the energy and non-energy benefits of energy efficient learning environments, and to develop a complete inventory of observations that are symptomatic of inefficient equipment or improper operation. KEEP maximizes spillover effects through this top-to-bottom, integrated approach to engaging schools.

KEEP Concierges are each accountable to their customers to coordinate KEEP program services in support of project development, procurement and contracting, funding and financing, implementation, commissioning, verification, and performance tracking. The Concierge is the customer’s single point of contact for energy efficiency and the gate keeper to other IDSM (Integrated Demand Side Management) opportunities. Making program staff available as dedicated customer resources is not a new idea. The Concierge is the evolution of the traditional ‘Account Manager’ role customers may have interacted with via other programs and vendors. Whereas Account Managers are focused on the sale of a particular solution, KEEP Concierges are embedded partners tasked with deepening program impact and creating a streamlined customer experience.

Program Delivery and Customer Services:

KEEP will increase energy efficiency savings in the Public Sector K-12 Sub-sector through a dedicated KEEP Concierge, who will serve as customers’ single point of contact from first marketing touch point to post installation support. The KEEP Concierge will provide the following services as steps to enrollment:

- Program Introduction and Education
- Comprehensive facility audits for lighting, HVAC, pool pump, and refrigeration measures
- Detailed energy efficiency proposals demonstrating ROI, payback period, and life cycle cost benefit analysis
- Assistance in writing public bids for installation and maintenance services outside project scope
- On-Bill Financing program education and enrollment support
- Post installation warranty service
- Lighting and HVAC controls training and education
- Energy Saving Reporting

KEEP will combine traditional and digital marketing tactics to increase program awareness and drive sales.

For Phase 1, KEEP will focus on contacting Maintenance and Operations Supervisors, District Superintendents and District- Level Energy Specialists. The KEEP staff will contact each school district 6 times in the first month of the campaign (email week 1 and 3, with follow up phone calls each week to set a meeting to further discuss the program).

If KEEP's top targets on the district level are not responsive to our initial efforts in months 1-3, our outreach will begin to target individuals at the school level in month 4 (Phase 2). KEEP has developed a strong referral network of community leaders in the non-profit space and SDG&E Account Representatives that can be utilized beyond our month 4 strategy, or sooner if onboarding is not meeting expectations. For instance, KEEP has created a partnership with SEI, an environmental nonprofit that builds leaders to drive sustainability solutions. For over 20 years, SEI has partnered with schools, communities, and businesses to develop a sustainability leadership pathway from elementary school to early career. SEI's flagship programs educate and empower students and emerging professionals to create thriving, resilient communities. KEEP has developed a strong relationship with San Diego and South Orange County account managers at SEI, who whole-heartedly support the goals of the KEEP program. Each of these account managers visit over 40 schools per quarter within the SDG&E territory and between them have over 500 contacts (teachers, administrators, operators and student organizations). These contacts will be leveraged by the KEEP team to access key points of contact integral to the school's onboarding. KEEP is also leveraging SDG&E account managers who work directly with contacts within the school district. These managers have strong relationships within the districts and can provide local community insights and introductions.

Although not specifically a DAC (Disadvantaged Communities) program, KEEP is fully prepared to serve schools located within designated DAC areas and those that qualify as HTR, by ensuring we have bilingual KEEP Concierges on staff. KEEP is designed to deliver a comprehensive suite of energy efficiency measures and to serve as an "on-ramp" to other IDSM strategies and technologies. The approach to outreach and customer engagement is high level; this is not a door-to-door campaign. KEEP outreach is focused on helping each school identify and implement new pathways to achieving meaningful energy savings.

KEEP is prepared to assess opportunities for energy efficiency along the full spectrum of adoption. In other words, whether the facility is an early adopter of energy efficiency technologies or one that has not been able to implement improvements for any number of reasons, the program will meet the school "where it is". The fact that the program is using OBF as the driver for implementation will give all schools the ability to include overdue

retrofits in their implementation plan. The NMEC analytics and energy saving performance determination will allow the project to benefit from the savings of energy measures that are no longer eligible for incentives. In this fashion, whether the assumption that schools in these geographical locations are worse off from an energy efficiency perspective is true or not, the program will capture current conditions and facilitate meaningful improvement.

Program Design and Best Practices:

From a customer perspective, KEEP provides turnkey no cost and low cost lighting, HVAC upgrades, and other Energy Efficiency measures to schools, partnered with a dedicated KEEP Concierge to serve as single point of contact for customer service. On the backend, the savings are captured through a population NMEC methodology, provided by Recurve. This is a completely new utility program model which addresses the significant market barriers faced by schools.

Market Barriers:

- B1 – Limited staff time;
- B2 – Lack of technical expertise;
- B3 – No universal acceptance of value proposition;
- B4 – Current process and tools are not intuitive;
- B5 – Timelines are not aligned;
- B6 – Public Sector can set rules for private sector

Project Management & Decision Support Services. The KEEP team’s long-running public sector resource programs, local government partnerships, and direct install commercial program offerings across California feature proven models for achieving savings in the public sector, in particular, by filling implementation and project management gaps that other resource acquisition programs overlook. Critical technical and decision support services include audits and project engineering, system design consultation, scopes of work for bid documents, reviewing contractor proposals, financing support, staff reports and presentations required for project approval by elected officials, and other needs identified by customers to move projects forward with urgency – and with accurate information. Barriers addressed: B1, B2, B3, B4, B5.

KEEP Concierge - Single Point of Contact. Historically, a customer may have needed to navigate at least three distinct programs if they wanted to plan HVAC, lighting, and pool upgrades, for example. As a streamlined, turnkey offering, KEEP simplifies the customer experience and provides a ‘one-stop shop’ for comprehensive EE projects targeting nearly any end-use in the customer’s portfolio. KEEP Concierges are dedicated project management and energy advisory resources available to attend to each customer’s unique demands. Concierges “connect all of the dots”: develop and manage customer and stakeholder relationships, coordinate technical resources required to develop and procure projects, provide decision support at each project milestone, and manage each customer’s progress along their strategic energy roadmap. The role of the KEEP Concierge is continuous throughout each customer engagement and does not end with the installation of energy efficiency measures. The KEEP Concierge is also responsible for coordinating referrals and technical assistance resources regarding other IDSM strategies beyond the scope of KEEP which are supportive of zero net energy, such as assessing the potential for demand response, on-site renewable energy generation, or energy storage. Barriers addressed: B1, B2, B4, B5.

Purposeful Engagement, from Chalk Board to School Board: KEEP leverages an extensive, actively engaged network of more than 700 teachers, administrators, building operators, and student organizations in SDG&E’s

service territory to build strong support for energy efficiency and ZNE-ready intervention strategies. KEEP Partner SEI manages and maintains this network of contacts. Not only does this tactic optimize the operational- and cost-effectiveness of KEEP program marketing dollars, but it also creates a strong feedback loop across all organizational levels and among the many stakeholders who support and who can communicate the multi-faceted value proposition for energy efficiency. Barriers addressed: B3.

NMEC for Persistent Project Performance. KEEP deploys NMEC analytics to screen customer buildings for program eligibility, to predict the impacts of energy efficiency projects – particularly during peak demand periods, and to directly address actual project performance detected at the meter – not indirectly through measure-level savings estimates. KEEP will embed ongoing energy savings tracking and persistence measurements to reinforce that EE is a financial investment and that returns on investments are driven by continued savings. NMEC keeps customers focused on lifetime project benefits and provides customers, other IDSM program providers, and vendors with greater insight to energy consumption patterns. Due to the high visibility of public K-12 energy projects, the use of NMEC analytics as a project performance screening and persistence tool will help influence private sector decision making and energy management behaviors. Barriers addressed: B2, B3, B5, B6.

Innovation

NMEC Combined with Direct Install: KEEP provides a comprehensive set of energy efficiency solutions with an NMEC measurement platform to deliver whole-building solutions to the public sector. This approach recognizes that comprehensive energy efficiency by definition cannot be delivered through a piecemeal, unintegrated process. No public sector program has delivered a combination of free and reduced cost measures, bundled with financing, all measured through an NMEC platform. This innovation is consistent with SDG&E’s Business Plan which stated, “Integrating NMEC into program design will provide a means of capturing stranded, to-code energy savings by incentivizing building owners to bring their buildings up to and beyond code efficiency.”

Move Away from Rebates: The KEEP Program will eliminate rebates to customers in favor of financing. As rebates have begun to shrink and disappear the time has come to accept that the market has been transformed. Most customers today believe energy efficiency is a sound investment. This combined with no and low costs for many measures reduces the need for rebates, however cash flow may limit whether projects can move forward or not. With SDG&E’s OBF offering and other low-interest loan vehicles the cash flow problem can be solved.

A Sense of Community: KEEP will expand on traditional forms of marketing (emails, cold calls, direct mail) to include partnership with Strategic Energy Innovations (SEI), an environmental non-profit that builds student and community leaders to drive sustainability solutions through SDG&E Energy School’s Program. Since 2016, SEI has worked directly with over 100 high schools and 20 school districts in the SDG&E service territory. In K-12 schools, SEI accomplishes this by providing sustainability project-based curriculum, teacher trainings, youth conferences, and conservation competitions, which KEEP will participate in and support. The student-facing KEEP team is comprised of young professionals, who themselves are passionate about energy efficiency, and its impact on global climate change. We believe that this team will be able to “speak the language” of today’s students. Fostering this connection between the Program and students in the SDG&E K-12 sector will allow us to leverage student interest in energy efficiency to help influence key decision makers into program participation.

SEI has a reach beyond students in K-12 schools, also partnering with community organizations to drive

sustainability. The combined efforts of KEEP and SDG&E Energy School’s has the ability to bring energy efficiency education from the students and teachers into the buildings where they learn, representing a unique opportunity for applied learning.

Metrics

As outlined in the previous section, KEEP’s program structure- which combines no cost and low cost efficiency measures to schools, with savings verified via Population NMEC -meets SDG&E’s innovation criteria. Additional KEEP metrics are detailed in Table 5 below.

TABLE 5:

KPI	Description
Program Performance: kWh Savings (net lifecycle savings)	Year to date, % achieved of net kWh savings required under the Agreement split on an even pro-rata basis
Program Performance: kW Savings (net lifecycle savings)	Year to date, % achieved of net kW savings required under the Agreement split on an even pro-rata basis
Program Performance: Therms Savings (net lifecycle savings)	Year to date, % achieved of net Therms savings required under the Agreement split on an even pro-rata basis
Program Performance: Delivery of Short, Mid and Long-term Outcomes	Demand Response Enrollment. Year to date % achieved compared to total businesses served.
Program Performance: Project Inspections	% of COMPANY inspections that pass internal inspection, year to date
Financials/Savings: kWh Goal & Expenditure Alignment	% achieved year to date of annual kWh goal divided by % of overall budget spent to date
Financials/Savings: kW Goal & Expenditure Alignment	% achieved year to date of annual kW goal divided by % of overall budget spent to date
Financials/Savings: Therm Goal & Expenditure Alignment	% achieved year to date of annual Therm goal divided by % of overall budget spent to date
Compliance: Customer Satisfaction	3 key areas evaluated: Overall Program Satisfaction, KEEP Concierge/Ease of doing business Satisfaction and Product/Technology Satisfaction
Compliance: Reporting Accuracy	Average % variance between the forecasted figures and actual figures for the reporting period (energy savings, expenditures, accruals, etc.)
Compliance: Workforce Standards	Aggregate of installation checklist answers: % of workforce standards being met in the installation checklist

Code to Savings

KEEP does not claim code to savings.

Pilots

Pilot projects are not a part of KEEP.

Workforce Education and Training

1. Expand/initiate partnerships with entities that do job training and placement;

CRI has an experienced assessment and implementation team ready to commence and anticipates using its existing workforce to deliver KEEP program services. In the event that program expansion or increased rates of program adoption necessitate hiring additional staff, CRI intends to access existing networks of local job placement and workforce development organizations to meet staffing requirements. For example, The Energy Skills Collaborative (TESC) has a regional initiative serving San Diego and Imperial County. TESC is a public-private partnership committed to increasing participation by underserved populations in new jobs, such as energy efficiency, being created by State mandates. Another resource CRI can access is the California Center for Sustainable Energy (CCSE) of San Diego County. CCSE regularly places graduates from its Green Grad Education and Training Upgrade Program into paid internships with local energy efficiency contractors. Other organizations that can expand the extent of collaboration at a technical services level (eg energy efficiency and other trades) include the Community College Chancellor's Office of Apprenticeship and the California Division of Apprenticeship Standards.

2. Require placement experience for any new partners in the workforce, education, and training programs and new solicitations;

NA

3. Require "first source" hiring from a pool of qualified candidates, before looking more broadly, beginning with self-certification; and

CRI will adhere to "first source" hiring from a pool of local qualified candidates. It will adopt "first source" language in its hiring policies to create a formal link between training for disadvantaged workers and job opportunities through its implementation of KEEP.

4. Facilitate job connections, by working with implementers and contractor partners, and utilizing energy training centers

While CRI appreciates that the primary goal of KEEP is to conserve energy, it also understands that programs like KEEP can be a source of “job creation” in the region. It’s understood that the IOU’s investment in this energy efficiency program offers a promising opportunity to build a career pathway for jobseekers with barriers to employment (“disadvantaged workers”). Our program will do its part to ensure that minority, low-income and disadvantaged communities are given ample opportunity to participate in our energy efficiency industry through collaborating with community-based partners to expanding entry into career track jobs for people from disadvantaged backgrounds, and to ensuring that entry-level jobs pay a living wage and offer defined pathways for advancement into higher skilled, higher wage jobs.

Workforce Standards:

LIGHTING WORKFORCE STANDARDS

As a C10 electrical contractor, CRI employs certified lighting technicians in order to comply with California workforce standards. This ensures that the lighting systems installed consistently work at peak performance at the lowest operating and maintenance cost..

Our lighting technicians have all the required qualifications for the installation of energy efficient products, including:

- 5-10 years of experience as a senior lighting technician or electrician
- Working knowledge of interior and exterior electrical lighting systems
- Ability to wire and terminate devices, perform quality control testing and strong troubleshooting skills
- Ability to install, inspect and test a wide variety of lighting systems related to energy efficiency
- Experience operating a bucket trucks, lifts, and other related equipment such as scaffolding and ladders
- OSHA 10 Hour construction industry outreach training
- Ability to work independently and exercise good judgment
- Excellent communication skills, ability to interact well with facilities managers and maintenance department personnel

OSHA guidelines are followed as much as our own safety policies and procedures. Training is provided when new technology enters the marketplace. Job safety analysis (JSA) are always documented prior to the commencement of work at each installation site. Identifying and documenting all job hazards is our number one priority prior to beginning any installation. Weekly tail-gate safety meetings provide updates and new information that is necessary for the installation of the project.

Our technicians are all trained in various safety procedures, including:

- Aerial personnel lifts
- Electrical safety awareness
- Working in confined spaces
- Electrical high and low voltage
- “LOTO” (lockout tagout)
- Fall protection
- First Aid

- Ladders safety
- Housekeeping and sanitation
- Personal Protective Equipment (PPE)
- Noise Exposure
- Hazard communication
- Fire protection

Our trained technicians take all the necessary steps in completing the installation of energy efficiency measures. Starting with the confirmation of proper materials needed for each job. Bill of materials are always provided and reviewed by construction field managers. This allows for any corrections or substitutions for the current scope of work. Once the bill of materials has been confirmed, all materials are inspected for any defects or shortages. Prior to beginning any work all equipment is checked for safety concerns. Once all pre-construction procedures have been completed, technicians begin the installation of the scope of work. Installations activities on school sites require additional care. CRI takes every precautionary measure to ensure that all debris generated by installation activities is cleaned up. All removed materials (old lamps or fixtures), are completely removed from work area by the end of each shift. Once the construction is completed for the day the construction field manager or supervisor will go through each room that work was performed to ensure that the room(s) is clean and secure. Daily installation and inspection reports are completed by the end of each shift. This provides information to all parties if any changes or issues were found during.

Technicians take the following steps to ensure that all installations are installed efficiently and properly:

- Verify job location is clear of hazards
- Cover or remove any items that may be damaged during the installation
- Determine if LOTO is required for each installation
- Provide temporary lighting if needed during LOTO
- Make sure that all PPE requirements are being met for scope of work
- Make sure that all cord, cable and raceway connections are intact and secure
- Inspect all lighting fixtures for any defects prior to the installation of measure. If defects are found inform construction field manager to complete report of issue and report to management.
- Test and verify equipment/materials installed for proper function
- Clean areas and vacuum or sweep any debris or trash
- Clear all areas of debris and old materials
- Walk the completed area with construction field manager or technician supervisor to ensure area was cleared and installations are working properly.

LIGHTING CONTROLS WORKFORCE STANDARDS

The Lighting Controls Workforce Standard applies to KEEP since Lighting Controls will be installed as part of the Program and energy savings associated with those installations will be eligible to receive Program services. The California Advanced Lighting Controls Training Program (CALCTP) is a statewide initiative aimed at increasing the use of lighting controls in commercial buildings. CALCTP educates, trains and certifies licensed C-10 electrical contractors and state-certified general electricians in the proper programming, testing, installation,

commissioning and maintenance of advanced lighting control systems. Such systems include ubiquitous dimmers, occupancy sensors, photo-sensors, relay modules and communication-based control devices. Hiring a CALCTP certified contactors indicates the contractor is state licensed (C-10), it employs supervisors who have successfully completed technical courses and certification programs and is proficient in advanced controls. The certification eliminates the guess work and uncertainty with regards to whether a firm is qualified to perform the work. In the case of KEEP, the program implementer CRI will perform the installation and is CALTP certified.

HVAC WORKFORCE STANDARDS

When job scope requires it, KEEP will utilize installation technicians that meet HVAC workforce standards. The HVAC Workforce Standard may apply to KEEP as HVAC energy efficiency measures will be installed as part of the Program and the energy savings associated with those installations will be eligible to receive Program services. Maintaining the HVAC Workforce Standard, as ordered, helps to ensure that the work being performed as part of this Program is of high quality. The standard lends itself to elevating the craftsmanship of the HVAC work to improve the odds of achieving a high levels of customer satisfaction; heightened customer satisfaction with the installation itself, the Program.

Even though the HVAC Technician or Contractor subject to the standard will contract directly with the Customer and not KEEP, the standard will increase the Customer's level of confidence in the Program's offer. KEEP services related to energy savings persistence benefits from quality installations. Ultimately, we believe that establishing standards as a basis for participation in incentives is a win for the Customer and the Program.

KEEP will create HVAC Workforce Standard materials, including an FAQ that describes, among other things, why it is in the Customer's best interest to hire and HVAC technician that meets the standard. These informational materials will be included over the course of the program, including but not limited to at outreach presentations and workshops, during enrollment and project development meetings, and when KEEP provides custom technical assistance. KEEP will create a pathway to simplify the identification of qualified technicians and needed, will work with Customers' existing pool of HVAC vendors or technicians to simplify selection. For example, we will identify accredited apprenticeship programs and contact information by County; PSP will prepare lists of CA Licensed C-20 by County, etc., and include that information in our FAQ.

All the KEEP non-financial incentives are expected to be paid to Customers (not to manufacturers, distributors, or retailers) in the form of services and 100% of the facilities will be Non-Residential. Of those, KEEP expects HVAC improvements will be included in approximately 50% of all Customer projects. Regardless of the estimated scale of these projects in the context of KEEP as a whole CRI is proposing to implement this workforce standard as a program requirement for participation as a best practice.

Overall, the KEEP approach will be to encourage all Customers to hire HVAC technicians that meet the standard in order to ensure long-term customer satisfaction and the persistence of energy savings. These two factors will favorably impact the how the KEEP is perceived in the K-12 Sector. Over time, the value associated with high levels of customer satisfaction and persistent energy savings far outweigh the cost of any effort related to enforcing the HVAC Workforce Standard. The Standard is in fact, in the Customer's best interest.

Disadvantaged Worker Plan:

Since CRI's inception, we have used hiring practices that allow for a greater pool of candidates, many of whom would fall into the disadvantaged worker category. For our lighting technician opportunities, CRI does not require a High School Diploma or GED, does not require English to be the primary language, and does not discriminate against prior incarceration for nonviolent crimes. We will continue to employ these hiring practices as we hire technicians for the KEEP program. In addition, CRI will report any the hiring of all disadvantaged workers through program duration while also surveying our existing staff to determine exact figures of how many meet these criteria.

K-12 Energy Efficiency Program

KEEP

Program Manual

2021

Eligible Measures

KEEP offers turnkey installation of wireless HVAC thermostats and various lighting measures. Additionally, the KEEP Concierge will be tasked with researching other efficiency opportunities commonly found in schools, such as pool heaters and pumps, and refrigeration. Eligible measures are detailed in Table 6

TABLE 6:

Category	Existing Technology	KEEP Measure
HVAC	Standard Thermostat	Pelican Wireless Thermostat
Lighting	F32T8	Type A 4ft Lamp
Lighting	Flood Lights (50W- 100W)	30W LED Flood
Lighting	A19 Lamp (12- 60W)	6W LED A19
Lighting	Highbay (75- 400W)	100W LED Highbay with OCC
Lighting	4 Pin PL Lamp (26 -42W)	8W LED Pin Lamp
Lighting	2 Pin PL Lamp (13-18W)	6W LED Pin Lamp
Lighting	Wallpack (100-250W)	30W LED Wallpack
Lighting	Canopy (50-100W)	30W LED Canopy
Lighting	Area Light (250-400W)	150W LED Area Light with OCC

Customer Eligibility Requirements

Customers must be public or charter K-12 schools or K-12 administration buildings with an active SDG&E service account and paying into the Public Goods Charge fund. Private schools are not eligible. There is no customer demand criteria for enrollment in program.

Contractor Eligibility Requirements

KEEP will not be subcontracting beyond the list of participating partners below.

Participating Partners

Participating partners are detailed in Table 7

TABLE 7:

Company	Role
California Retrofit Inc.	Prime Contractor
QuEST	Advisor and HVAC Contractor

Strategic Energy Innovations	Marketing Leads/ Community Outreach
Recurve	NMEC Platform
Stellar Sales	Lighting Distributor
Pelican	Wireless Thermostat Manufacturer

Additional Services

KEEP provides each school district with a dedicated account manager, the KEEP Concierge. In addition to providing comprehensive facility audits for HVAC and Lighting, the KEEP Concierge will investigate and quantify efficiency opportunities for other measures such as pool pumps, pool heaters and refrigeration.

The KEEP Concierge experience will also provide schools with:

- Assistance in writing public bids for installation services
- On-Bill Financing program education and enrollment
- Post installation warranty service
- Lighting and HVAC controls training and education
- Savings persistence reports
- Referrals to other energy efficiency and demand response programs

Audits

The first step to program enrollment is a full scale facility audit. This is conducted by the school’s assigned KEEP Concierge and completed in Snapcount auditing software. Schools are then provided a detailed energy efficiency proposal demonstrating ROI, payback period, and life cycle cost benefit analysis. Post- Installation audits to be performed by SDG&E.

Sub-Program QA

Our Quality Assurance Plan will be strictly followed to ensure high levels of customer satisfaction, cost-effectiveness, and mitigation of program abuse of any kind. CRI places special emphasis on quality assurance. Our construction supervisors have been with the company for more than 10 years and are CALCTP and California state certified. Quality construction with best installation practices is mandatory.

- We will use only pre-selected brand-name, top-of-the-line quality products purchased from manufacturers with at least 5 years in the business.
- We will adhere to CRI’s simple yet effective Six-Step Quality Assurance Program (described below).
- All projects will comply with California installation regulations.

Six Step Site QA:

- Secure and contain area for construction activity; cover all furniture and equipment in the construction area, and identify and remove any obstacles to safe construction
- Remove all debris from post construction area
- Clean and sweep area of dust, wire strips, and other construction generated debris
- Ground crew will pre and post- inspect construction area
- Supervisor performs final inspection
- Checklist completed and signed off for day's construction

Other Program Metrics

All program metrics are detailed in Table 5 of Implementation Plan.

KEEP Logic Model

The KEEP Logic Model is presented in Table 8

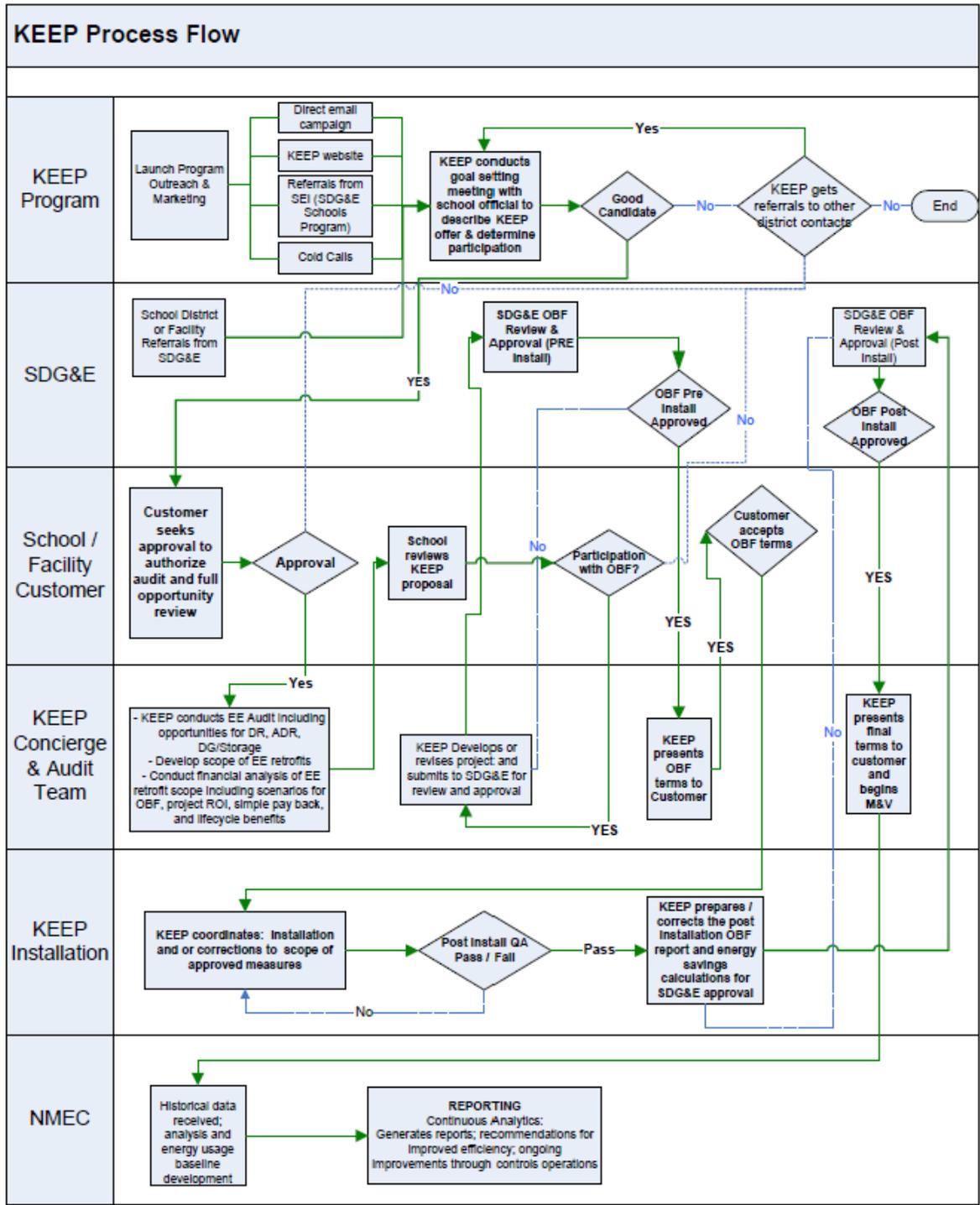
TABLE 8:

KEEP (K-12) Services Program - Logic Model								
	Resources	Activities	Outputs	Customers / Market Actors	Short Term Outcome < 1 year	Intermediate Outcome 1 to 3 years	Long Term Outcome > 3 years	
Overarching Resource of Program Management Experience and Mature Feedback Systems for Continuous Program Delivery Improvement	KEEP Program / Budget KEEP Implementation Team	<ul style="list-style-type: none"> Customer Outreach Document Development Program Enrollment 	Written KEEP / School District agreement for Program Services	District Superintendents, K-12 Principals, Facility Director	Leads to signed formal agreement for Audit or Program Services with commitment to implement			
	KEEP Engineering & Technical Services	Energy Efficiency Audit, ex ante calculations, financial / analysis (per OBF standards), ESCO support, etc.	<ul style="list-style-type: none"> Ex Ante audit findings and recommendations Results of ESCO related support services Fulfillment of OBF loan agreement documents 	Dist. Superintendent, K-12 Principals, Facility Director or School Reps with Executive Power	<ul style="list-style-type: none"> School agrees to non-cash "incentives" and OBF for implementation of retrofit projects identified by KEEP Leads to School recognition of KEEP value proposition 	School contracts for KEEP services and agree to a non-cash incentives based on OBF and value of KEEP services; technical assistance and Energy Concierge		
	KEEP Project Staff <i>Added Resource: School Governing Body (e.g. school board)</i>	Prepare presentation of KEEP project or services for agency governing body approval	Project Approval / Vote	School District Procurement	Leads to "real time" association of KEEP Program value (equal or greater than cash incentives)	Customer uses KEEP and OBF as first program of choice		
	<ul style="list-style-type: none"> KEEP Project Staff KEEP Engineering & Technical Services 	<ul style="list-style-type: none"> OBF pre / post installation submission and approval 	<ul style="list-style-type: none"> Fulfillment of loan agreement or modification, OBF documentation Design Build technical assistance for project implementation RFP and procurement process documentation 	Dist. Superintendent, K-12 Principals, Facility Director or School Reps with Executive Power	<ul style="list-style-type: none"> School implements recommended energy savings measures OBF loan issued KEEP Concierge Services continue Leads to Agency recognition of the value of KEEP services (assessment through procurement) and OBF 	<ul style="list-style-type: none"> Over time, School District experiences: <ul style="list-style-type: none"> Measurable energy reductions and high rates of energy realization Uses fewer KEEP resources Continues to use OBF and integrates OBF in its sustainability plans 		
	<ul style="list-style-type: none"> KEEP Implementation Team KEEP Engineering & Technical Services including NMEC 	<ul style="list-style-type: none"> Ongoing energy persistence monitoring Ongoing economic analysis and modeling 	<ul style="list-style-type: none"> Quarterly energy monitoring persistence reports Measurable reductions in kW, kWh, and Therm usage 	Dist. Superintendent, K-12 Principals, Facility Director or School Reps with Executive Power	Leads Customer to recognize value of EE projects without cash incentives; Customer thinks of energy efficiency on par with financial investments	KEEP significantly reduces need for Customer to use traditional incentive programs		
							<ol style="list-style-type: none"> 1. Measureable reduction in kW, kWh, and Therm usage 2. School District need for cash incentives for energy efficiency are eliminated 3. School Districts are willing and able to hire their own technical consultants to achieve sustainability goals (ZNE) 	

KEEP Process Flow Chart

The KEEP process flowchart is detailed in Table 9

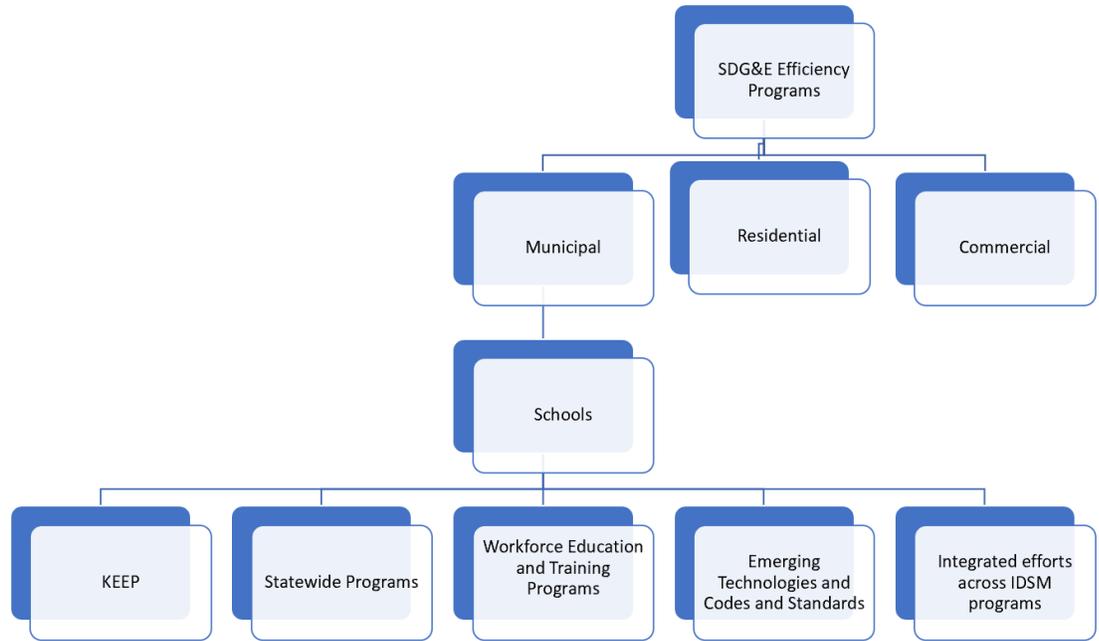
TABLE 9:



KEEP Diagram of Program

Diagram of KEEP program is presented in Table 10

TABLE 10:



KEEP Quantitative Program Targets

KEEP Quantitative Program targets are presented in Table 11.

TABLE 11:

	2021	2022	2023	2024	Total
Net kWh	925,757	3,703,027	3,703,027	3,703,027	12,034,838
Net Therms	6,419	25,676	25,676	25,676	83,447
Net kW	168	485	485	485	1,623
Budget	\$786,280.00	\$ 2,985,350.00	\$ 2,923,528.00	\$ 2,923,528.00	\$ 9,618,686.00

Measurement & Verification(M&V)
Population NMEC Methods
Subcontractor – Recurve

M&V Plan

The KEEP program has partnered with the industry leading NMEC platform from Recurve. Recurve's Fleet Management tool for ongoing tracking of building-level energy savings is the platform for KEEP's automated M&V.

At the core of the Recurve's M&V engine are the CalTRACK Methods. The OpenEEmeter code base provides a complete implementation of the Hourly CalTRACK 2.0 methods for repeatable, transparent calculation of the savings impacts for each participant, controlling for factors like weather and occupancy. The methods and the code are executed through the Recurve platform, which enables site-specific comparison of the change in consumption for the same participant before and after the installation of the measure.

The CalTRACK methods are based on the CPUC NMEC Rulebook v2 as well as industry guidelines established by The American Society of Heating, Refrigerating and Air-Conditioning Engineers ([ASHRAE Guideline 14](#)) and the Uniform Methods Project (Chapter 8 - Whole Building Methods) and meet all IPMVP Option C¹ requirements. CalTRACK Hourly methods are derived from the LBNL Time of Week and Temperature model and have been validated by EVO's Advanced M&V Testing Portal.

The CalTRACK methodology goes farther than ASHRAE, UMP, or IPMVP guidelines by including rigorous steps for data cleaning and organization, weather station selection and weather normalization; the hourly methods include automated building state (occupancy) normalization. CalTRACK also employs a large parameter search for specific model parameters to achieve best fit to the raw consumption data on an individual meter basis.

Describe Data Collection and Analysis Monitoring Activities

The NMEC platform lends itself constant performance feedback, unlike custom and deemed platforms which provide feedback only after M&V studies are complete. This constant feedback will allow for course corrections such as updated training, recommissioning and possibly change the measure mix. The data collected to support NMEC follows the CalTrack Methods. Ongoing program performance will be monitored through the Recurve platform. The program targets at least 10% savings from each school, which will be tracked monthly by Recurve. These monthly reports will permit program adjustments from increasing marketing and recruitment through changing measures and improving training. If savings are less than 10% at a particular school, they will be kept in the program because we are using a population approach where some will be some that are above 10% and others below, but on average we expect the population to be above 10%

To meet accuracy goals of savings estimates, the program will pre-screen participants to ensure that their baseline models are well behaved with a CVRSME of less than 10%. Schools that fall out of that range may be required to commit to higher savings goals or more extensive measures.

¹ International Performance Measurement & Verification Protocol: Concepts and Options for Determining Energy and Water Savings, Volume I, Revised March 2002 DOE/GO-102002-1554, International Performance Measurement & Verification Protocol Committee

Appropriateness of Meter-based Platform

Normalized Metered Energy Consumption (NMEC) and open-source approaches are less expensive and performed better than modeled baselines and proprietary tools for evaluating energy efficiency in commercial buildings, according to a PG&E and [SBW Consulting study](#).

The study's goal was to test the reliability of NMEC and to recommend the best methodology for estimating savings. To do so, it compared different approaches on twelve commercial building retrofits that were selected for model fit and level of savings.

Among other important results, the study's key findings across both the SBW Consulting report and the final joint commission summary found that NMEC models consistently produce accurate estimates and that program administrators should use transparent, open-source, Option C based algorithms.

These findings are critically important for any NMEC program design, particularly those that incorporate business models in which payments based on M&V results are made directly to building owners or to their tenants through energy service agreements. In all of these cases, the definition of performance must be clear and transparent so that cash flows can be forecast and managed and all parties have the confidence to participate.

In other words, there is too much risk for market actors and stakeholders if the method to determine savings (and its implementation) is not known upfront and fully transparent and verifiable. Savings can vary significantly based on an evaluator's choice of normalization procedure, which variables to include in a model, how to implement that model, how to identify and handle events, and even the process for cleaning and organizing data.

Recurve believes that the path to scale in commercial energy efficiency begins with the standardization and automation of routine M&V. Transparency and open models should replace black boxes and complex custom calculations, and real consumption data should be used wherever possible over models and assumptions.

When non-routine events do occur there should be a pre-approved contract that defines the parameters of non-routine adjustments so they can be managed and enforced consistently through an enforceable contract (for more details on how this can work, see [Bankable M&V for Commercial Buildings](#)).

Eligibility Criteria and Evidence/Screening

The KEEP program will develop a NMEC baseline model based on the Temperature and Time of Day Model for each potential participant. Goodness of fit statistics such as CVRSME and NMBE will be reviewed to determine if NMEC can be reasonably applied to each specific school/building. If the school/building baseline cannot be modelled well, then the program's ability to meet statistical requirements for robust savings and will not be allowed into the program.

Description of Population-level Approach

The KEEP program will use population level NMEC. Recurve will implement revenue-grade savings calculations based on CalTRACK 2.0 Hourly methods in accordance with standard

industry guidance for whole building M&V. Analysis will be based primarily on metered performance, using revenue-grade metering data provided by SDG&E or submetered data if approved in advance. Within the Population NMEC track, site-based savings calculations and portfolio aggregation will allow SDG&E to maintain oversight in a cost-effective, yet rigorous fashion.

This task is significantly more challenging than it might seem at first blush. We know this first hand because Recurve is the system of record for payments for more than a half-dozen similar programs. Initially, we just provided savings calculations for dozens and then hundreds of buildings and left it to program administrators to turn the savings results into payments. We found, however, that administrator accounting systems were unable to handle the myriad challenges that contract terms presented.

Changes in underlying meter or weather data, non-routine events, the effects of COVID-19, and dozens of other complications proved impossible to keep track of manually. This challenge was so significant that PG&E and NYSERDA funded Recurve's development of a Ledger to manage the incremental payments due to participants in their pay-for-performance programs. Today, in addition to PG&E and NYSERDA, Marin Clean Energy (MCE), Energy Trust of Oregon, BayREN, East Bay Community Energy, and SoCal Gas all rely on Recurve's Ledger to track the payments within their meter-based savings programs.

There are obvious components of a payment function that should be table stakes for any provider of this type of service. Calculating monthly energy savings is one. However, even this basic piece of functionality can create significant uncertainty if the savings calculation is not transparent and replicable to all parties involved. Recurve helped develop the CalTRACK methods to solve this problem specifically. By stipulating exactly the steps involved in calculating savings, CalTRACK creates the transparency required to ensure there are no surprises when monthly savings numbers are reported. Governance of the CalTRACK methods now rests within the Linux Foundation; this ensures that they can be continually improved through open-source, consensus-based processes. Recurve implements CalTRACK savings calculations through the OpenEEmeter, a software library originally developed by Recurve, but now also governed by the Linux Foundation as a community resource.

However, the savings calculation itself is a small part of the challenge of providing a savings value for each participant. The deeper software requirement is the ability to write custom valuation functions that reflect the terms and conditions of a contract or Power Purchase Agreement.

These can be quite varied, but must reflect the underlying savings calculations and the particular measurement and verification protocols adopted for the project.

Describe Isolation of Impacts from Other Programs

Ensuring the impacts from other programs are isolated begins with proper screening of potential participants. Schools that have participated in other programs within 12 months will be excluded from program participation. Schools will be screened by using internal data on past participation from SDG&E as well as through interviews. Once enrolled in the program, all participants will sign and affidavit attesting that they will not participate in other programs without first notifying the KEEP Concierge. Failure to do so can result in removal from the program.

Population-level approach and comparison group

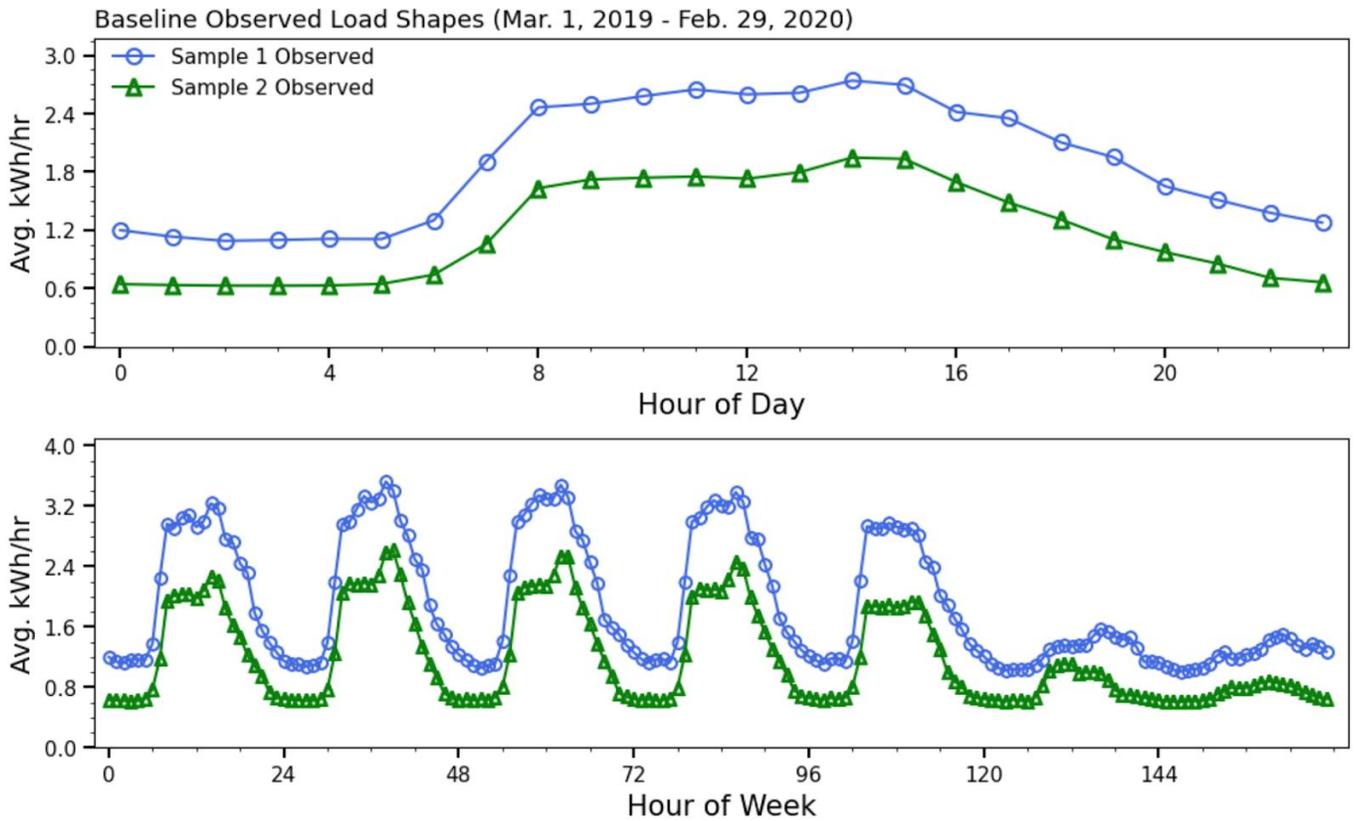
KEEP will use a population-level approach with a comparison group to determine program savings. Comparison groups have similar school types (High School, Intermediate, Elementary), climate zone, sub climate zone, and enrollment. The specifics of the population-level approach are presented below.

KEEP will request daily gas and hourly electric data for schools from SDG&E. These data will be requested for 365 days before program launch. For tracking of both treated customers and non-participating schools (the comparison group), Recurve will need at a minimum quarterly refreshes of consumption data. Recurve has identified schools as meters under NAICS codes 611111, 611113, and 611691. Any schools that are enrolled in the program over time will be dropped from the comparison group.

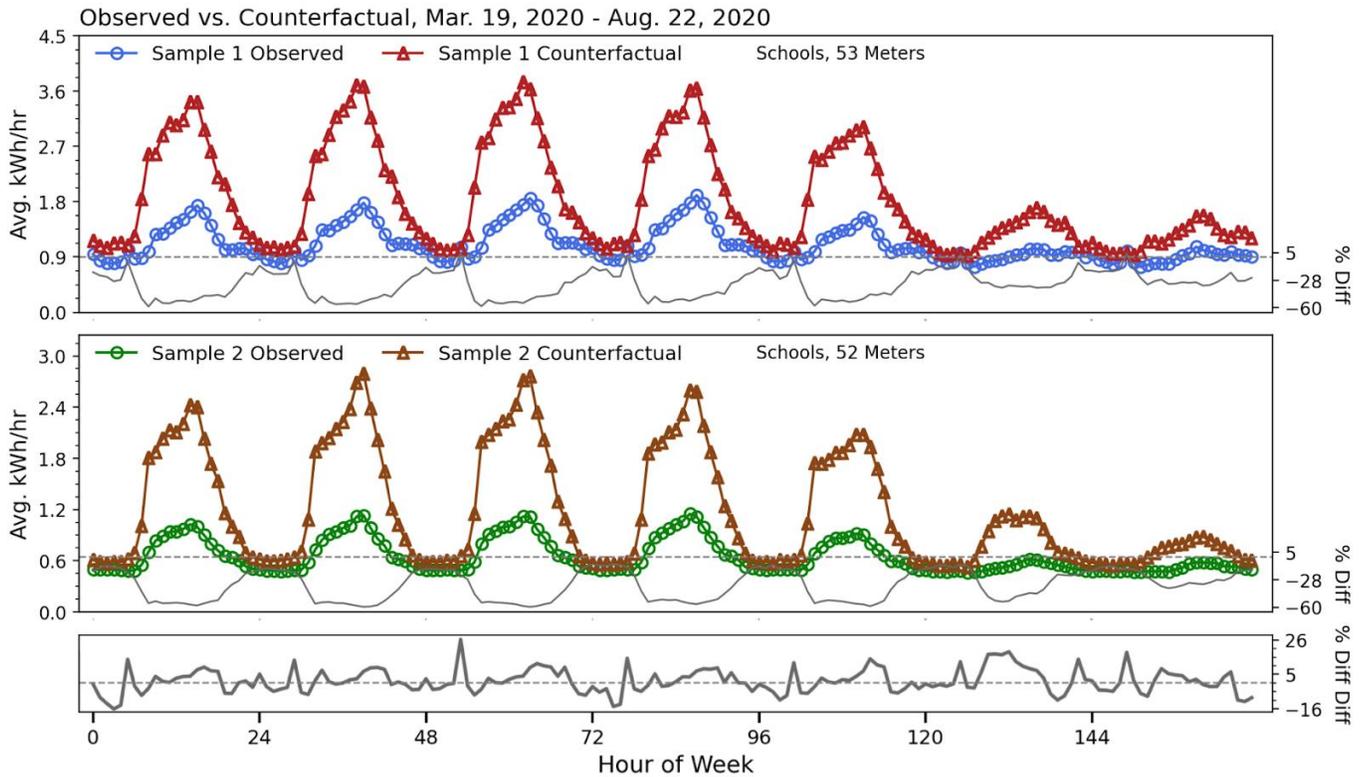
This sampling plan stems from extensive research that Recurve conducted in partnership with the Department of Energy to establish comparison groups to account for COVID energy impacts and other exogenous trends. Within the non-residential sectors, Recurve found that building type (offices, restaurants, schools etc.) was the most important basis for comparison group selection due to the different responses observed in the different segments of the economy. The full details of this research, the comparison group sampling methods, and the specifics of the comparison group savings adjustment calculations (difference of differences) are available in the report, Comparison Groups for the COVID Era and Beyond.

In the figures below we reproduce the COVID impacts and comparison group data compiled as part of that report specifically for schools.

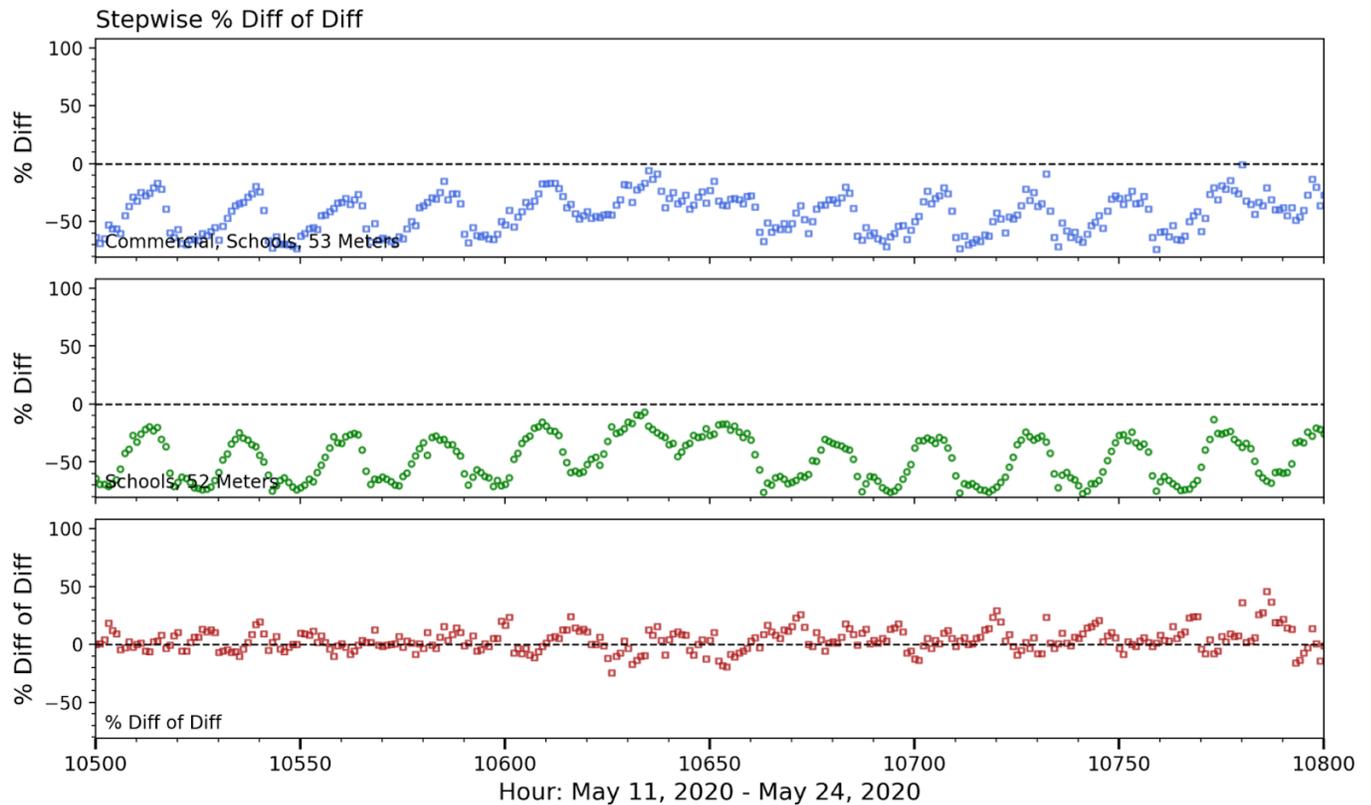
The below figure shows the average daily (top) and weekly (bottom) electric load shape for two independent random samples of schools in MCE service territory. While they exhibit a significant difference in total energy consumption, the shape of the hourly consumption is nearly identical, which allows for a reliable difference of differences adjustment on a percentage basis.



The next figure shows every step of the percentage difference of differences calculation where the “intervention” is the statewide stay-at-home order that California experienced on March 19, 2020. The bottom panel shows that the percent difference of differences consistently hovers around zero - an indication that the comparison sample is providing a good representation of the “treatment” customers.



The bottom panel of the final figure shows hourly residuals in the percent difference of differences calculation for schools. While some variation is observed, residuals hover around zero and very little systematic bias is observed. If a random sample of non-residential customers were selected, Recurve’s analysis for the DOE shows that 30% error (on a total consumption basis) would be expected when measuring the impacts of demand side interventions within schools.



Evidence for estimating savings method

Normalized Metered Energy Consumption (NMEC) and open-source approaches are less expensive and performed better than modeled baselines and proprietary tools for evaluating energy efficiency in commercial buildings, according to a PG&E and SBW Consulting study.

The study's goal was to test the reliability of NMEC and to recommend the best methodology for estimating savings. To do so, it compared different approaches on twelve commercial building retrofits that were selected for model fit and level of savings.

Among other important results, the study's key findings across both the SBW Consulting report and the final joint commission summary found that NMEC models consistently produce accurate estimates and that program administrators should use transparent, open-source, Option C based algorithms.

Past examples of projects or programs successfully employing NMEC

Below are examples of current NMEC programs where the Recurve platform is used to determine savings.

Contact Info	Description of Project and Status
--------------	-----------------------------------

<p>San Francisco Department of Environment (SFE)</p> <p>Barry Hooper, barry.e.hooper@sfgov.org</p>	<p>Recurve has been contracted through SFE to run the Commercial Pay for Performance program for BayREN. The Recurve platform, which serves as the CalTRACK based M&V engine, functions in the same capacity as it will for the SDG&E k-12 school meter-based, NMEC program.</p>
<p>NYSERDA</p> <p>Kyle Monsees Project Manager kyle.monsees@nyserda.ny.gov</p>	<p>New York State Energy Research and Development Authority (NYSERDA): Advanced Measurement and Verification Platform Provider</p> <p>The Recurve platform served as an out of the box solution for NYSERDA and has been developed to perform weather normalized metered energy consumption (NMEC) savings calculations to true up performance payments in NYSERDA’s Pay for Performance pilot.</p>

	ConEdison agreed to run a Commercial P4P program under the NYSEERDA pilot.
New South Wales Department of Planning and Environment Simon Bunstead simon.bunstead@enviro nment.nsw.gov.au	Provision of a trial for cloud-based M&V services The Government of New South Wales selected Recurve to trial approaches in advanced measurement and verification. To do so, the Recurve Platform was selected to analyze the historical performance of all government buildings operated by the NSW Government. The Recurve platform, which serves as the cloud-based advanced M&V engine for NSW on government buildings, functions in the same capacity as it will for the SDG&E k-12 school meter-based, NMEC program.

Identify Key Similarities and Differences between Above Examples and KEEP Program

The commercial programs described above focus primarily on Temperature and Time of Day models as part of the CalTRACK methods. Schools operate on a rigid schedule, which makes them more homogenous and easier to model relative to programs with a more heterogeneous operating pattern. The homogeneity of schools makes statistically modelling problem relatively easier compared with commercial programs that mix office buildings with grocery stores and retail outlets. In addition, the KEEP program focuses primarily on lighting and HVAC, where broader commercial programs may include refrigeration. Overall the set and consistent schedules provided by schools and the common measures make modelling schools energy consumption a more tractable problem.

Data Collection Plan and Process

Recurve will utilize the open-source CalTRACK 2.0 Hourly methods to directly measure the hourly impacts of the KEEP program. The CalTRACK Hourly methods are described in full detail at www.caltrack.org and are summarized in a recent article on Recurve’s website¹. An overview is also presented below.

2.1. Data Inputs.

The data requirements to apply CalTRACK methods to a single metered site are listed in this section. These represent the “ideal”. Additional constraints and sufficiency requirements follow in section (2.2) and considerations for handling missing or incomplete data follow.

² <http://docs.caltrack.org/en/latest/methods.html#section-2-data-management>

¹ <https://www.recurve.com/how-it-works/caltrack-hourly-methods#:~:text=The%20CalTRACK%20hourly%20model%20defines,week%2C%20occupancy%2C%20and%20temperature>

2.1.1. Energy consumption data (meter data). This data must have the following qualities:

2.1.1.1. Periods of usage, usage during those periods. Can be provided as billing data or as AMI data.

2.1.1.2. May be combined from multiple sources or accounts.

2.1.1.3. Must be converted to units of energy consumption, not supplied volume. This can be achieved, for example, by using a therm factor conversion.

2.1.1.4. Must be subject to the constraints outlined in 2.2.

2.1.1.5. Flag or directional indicator for presence of net metering.

2.1.2. Set of candidate weather station sites. Each weather station should have the following data available:

2.1.2.1. Weather station site latitude and longitude coordinates.

2.1.2.2. Climate zones information if needed in weather station matching (see 2.4).

2.1.2.3. IECC Climate Zone.

2.1.2.4. IECC Moisture Regime.

2.1.2.5. Building America Climate Zone.

2.1.2.6. California Building Climate Zone Area (if site is in the state of California).

2.1.2.7. Observed dry-bulb temperature data, subject to the data requirements outlined in 2.2.

2.1.3. Project data.

2.1.3.1. Date(s).

2.1.3.1.1. Project start date. The date of the beginning of the intervention period (see 1.4.4) during which energy use will be ignored. If the exact start date is not known, an estimate may be used in place of a recorded start date. The estimate should err on the side of an earlier start date.

2.1.3.1.2. Intervention completion date. The date of the end of the intervention period. This date marks the beginning of the reporting period (see 1.4.3). If the exact completion date is not known, an estimate may be used in place of a recorded completion date. The estimate should err on the side of a later start date.

2.1.3.1.3. Intervention active date. For certain interventions without a defined “project start” (e.g. behavioral interventions), the date when a behavioral intervention(s) became active. Use this as the intervention completion date as well.

2.2.3. Billing data is considered sufficient for baseline period under the following conditions:

2.2.3.1. Estimated periods values should be combined with next period up to a 70-day limit. Estimated periods are counted as missing data for the purpose of determining data sufficiency to limit the number of estimated reads used for analysis.

2.2.3.2. If average temperatures for billing periods are calculated by averaging higher frequency temperature data, the high-frequency temperature data must cover 90% of each averaged billing period.

2.2.3.3. If daily average temperatures are calculated by averaging higher frequency temperature data, no more than 50% of high-frequency temperature values should be missing.

2.2.3.4. Off-cycle reads (spanning less than 25 days) should be dropped from analysis. These readings typically occur due to meter reading problems or changes in occupancy.

2.2.3.5. For pseudo-monthly billing cycles, periods spanning more than 35 days should be dropped from analysis. For bi-monthly billing cycles, periods spanning more than 70 days should be dropped from the analysis.

2.2.4. Hourly temperature data is considered sufficient under the following conditions:

2.2.4.1 Temperature data may not be missing for more than six consecutive hours. Missing temperature data may be linearly interpolated for up to 6 consecutive missing hours.

2.2.5. Data spanning beyond the period should not be used in analysis.

2.2.6. Projects should be excluded if net metering (i.e., for photovoltaics or other on-site generation) status changes during the baseline period.

2.2.6.1. Exception: Future efforts may provide the ability to access sub-meter data that may allow for backing out onsite generation and storage to arrive at savings. Currently, this data is not readily obtained.

2.2.7. Projects should be flagged if electric vehicle charging is installed during the baseline period.

2.3. Guidelines for handling data quality issues.

In many cases, data quality issues can be resolved by going back to the source to resolve issues in export or transfer. This guidance is a second line of defense for handling or correcting for common data issues, and are provided in the hope of mitigating the myriad issues and discrepancies which arise using different methods for data cleaning.

2.3.1. Impossible dates.

2.3.1.1. If conducting billing analysis, and if day of month is impossible (e.g., 32nd of Jan), use first of month.

- 2.3.1.2. *If month (e.g., 13) or year (e.g. 2051) is impossible flag the date and remove it from the dataset. Check for mis-coding, such as 2015 -> 2051.*
- 2.3.2. *Duplicated meter or temperature records.*
 - 2.3.2.1. *Combine available versions into a single time series by dropping duplicate records, using the most complete version possible. If a record for a particular timestamp conflicts with another version, flag the project for possible existence of multiple meters or submeters. If this is confirmed, the usage from multiple meters may be aggregated.*
- 2.3.3. *Ensure that meter and temperature data is using matching and correct timezone and daylight-savings handling across all data sources.*
- 2.3.4. *NOAA weather is sampled roughly hourly with minute-level timestamps. This should be converted to hourly by first computing a minute-resolution time series using near interpolation of data points with a limit of 60 minutes, then downsampling to hourly temperature by taking mean of linearly-interpolated minute-level readings.*
- 2.3.5. *Negative meter data values should be flagged for review as they indicate the possible unreported presence of net metering.*
- 2.3.6. *Extreme values: Usage values that are more than three interquartile ranges larger than the median usage should be flagged as outliers and manually reviewed.*
- 2.3.7. *Generally recommend an audit for dataset completeness using expected counts of sites, meters, and projects.*
- 2.3.8. *Roll up data if not given with expected frequency.*
- 2.4. *Matching a site to a weather station.*
 - 2.4.1. *Weather station to be used is closest within climate zone that meets CalTrack data sufficiency requirements. See Appendix for Details.*
 - 2.4.1.1. *If there are no weather stations within that climate zone, fallback to closest weather station that has complete data.*
 - 2.4.2. *Matches further than 200 km should be flagged for review, as these distant matches may sacrifice interpretability of the model.*

Methods for Determining Program Influence

Generally, schools are not the most proactive users of energy efficiency programs. Most actions occur through large funding increases, e.g. Prop39 or ESCO projects. School budget cuts and lack of infrastructure investment leads Buildings and Grounds staff to focus their meager resources on fire fighter. The KEEP Concierge will conduct an initial interview to understand 1) what projects have been completed in the 5 years, 2) how those projects were funded and 3) what are the current energy efficiency projects and how are these funded. The first two questions will help understand the role of energy efficiency in the school/district, while the last question will set the stage for future work. These questions and responses will set the baseline for program influence. Any project with existing encumbered funds will be eliminated from the program,

same is true for ESCO projects that have moved past the are under contract after the Investment Grade Audit phase.

Approach to Meeting Statistical Significance Requirements

For Fractional Savings Uncertainty, the CPUC threshold in the population NMEC is 25% for the portfolio, per ASHRAE 14 guidelines. However, at this early stage we cannot actually calculate it without the baseline CVRMSE of the models of all potentially treated buildings. This is not possible now but can be addressed when data is available. The KEEP program, led by Recurve, will determine the size of the portfolio based on the 25% FSU requirement. In addition to portfolio size, the KEEP program will focus on two additional components, -1) selecting buildings with more consistent usage patterns and 2) achieving deeper savings within the portfolio. Both of these are facilitated by effective targeting/screening of buildings.

Key Assumptions to Support Precision and Confidence Levels

The key assumptions for our level of precision and confidence are based upon 1) a sample of approximately 20%, 2) project savings that is 10% or greater, and 3) projects that have a CVRSME of 20% or less.

Approach for Monitoring and Documenting Energy Savings

The M&V approach will follow the CalTRACK methods³. Verification reports for all installations will be provided to SDG&E, though these reports will not be used to determine savings.

Approach to Determining EUL Values

The KEEP Program will use a savings-weighted EUL approach based upon the project audit. Savings for each measure will be identified in the customer audit and project development documentation. DEER EULs will be used for each measure. The project EUL will be based on the sum of the each EUL times its respective savings weight. The savings weight is the percentage of total savings for each measure.

Methods for Identifying and Adjusting for non-routine events

Regarding a method of identifying and adjusting for non-routine events, a pre-determined percentage savings threshold of +/- 50% will be used to identify and eliminate outliers with likely non-routine events. In addition, program eligibility criteria will remove customers with events such as installation of solar PV or EV charging (depending on the eligibility criteria agreed upon).

Method of Determining Program Influence

KEEP will use the default NTG value of 0.95, which is available to NMEC programs. The KEEP program has protocols in place to reduce free ridership. These protocols are discussed above in “Methods for Determining Program Influence.”

³ <http://docs.caltrack.org/en/latest/methods.html>

<http://docs.caltrack.org/en/latest/methods.html#section-3-b-modeling-hourly-methods>

Plan for Addressing Project Level Savings Under 10%

The KEEP Program, because of its comprehensiveness is targeting savings greater than 10 % of annual consumption. Schools that have already made significant energy efficiency investments, thus leaving limited opportunity for additional savings, will be referred to other IDSM programs such as DR, ADR and self generation/storage.

Describe M&V Team

All KEEP program M&V will be handled by Recurve. Currently Recurve is the M&V consultant of choice for NMEC programs offered by PG&E, Sacramento Municipal Utility District, Marin Clean Energy and Southern California Gas Company. Recurve's M&V activities and approach will be consistent with the CalTRACK Methods.

Description Compensation Mechanism at Each Stage of the Project

The KEEP program assumes all of the savings and performance risk. As public entities, School districts generally have difficulty participating in "at-risk" programs because all project funding must be encumbered before it can be allocated. It should be noted that program participants do not receive an incentive as the program focuses on technical assistance and OBF financing.

Method for Calculating Incentives

The KEEP program does not offer incentives to program participants, but instead provides technical support and OBF, which were identified as more important program components relative to rebates in the SDG&E Business Plan.

Description of Quality Assurance Practices

All KEEP program savings claims will be calculated by Recurve and consistent with CalTRACK Methods. Recurve staff will perform all quality assurance. Central to these methods is transparency. All calculations and methods will be available for review by the PA and EM&V consultants.

Description of M&V Software

At the core of the Recurve's M&V engine are the CalTRACK Methods. The OpenEEmeter code base provides a complete implementation of the Hourly CalTRACK 2.0 methods for repeatable, transparent calculation of the savings impacts for each participant, controlling for factors like weather and occupancy. The methods and the code are executed through the Recurve platform, which enables site-specific comparison of the change in consumption for the same participant before and after and the installation of the measure.

Discussion of Risk and Savings Uncertainty

For Fractional Savings Uncertainty, the CPUC threshold in the population NMEC is 25% for the portfolio, per ASHRAE 14 guidelines. However, at this early stage we cannot actually calculate it without the baseline CVMSE of the models of all potentially treated buildings. This is not possible now but can be addressed when data are available. The KEEP program, led by Recurve, will determine the size of the portfolio based on the 25% FSU requirement. In addition

to portfolio size, the KEEP program will focus on two additional components, -1) selecting buildings

with more consistent usage patterns and 2) achieving deeper savings within the portfolio. Both of these are facilitated by effective targeting/screening of buildings.

Description of Below-code Savings Targeting

Working with SDG&E, the KEEP program will identify schools and districts that are underrepresented in SDG&E's programs. In addition, the KEEP program will review Prop39 data to determine which schools and districts did not fully participate, and therefore have below-code savings.