

2021-2023 Energy Efficiency Programs

Multi-Family Space and Water Heating Controls (MF SAWH) Program

Program Implementation Plan (PIP)

January 24, 2021

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1.0 Program Name: Multi-Family Space and Water Heating Controls (MF SAWH) Program

Program ID: 5660060797

Program Type: Third Party

2.0 Projected Program Budget Table

Category	2021	2022	2023	Total
Administration	\$21,695.00	\$51,103.00	\$51,103.00	\$123,901.00
Marketing	\$4,202.00	\$9,899.00	\$9,899.00	\$24,000.00
Direct Implementation Non-Incentive	\$18,172.00	\$42,806.00	\$42,806.00	\$103,784.00
Direct Implementation Incentive	\$190,218.00	\$448,068.00	\$448,068.00	\$1,086,354.00
Total	\$234,287.00	\$551,876.00	\$551,876.00	\$1,338,039.00

3.0 Projected Program Gross Impacts Table

First Year Annualized Deliverable	2021	2022	2023	Total
Gross Therm Savings	52,149	122,726	122,726	297,601
Gross kWh Savings	264,600	623,280	623,280	1,511,160
Gross kW Reduction	221.13	520.884	520.884	1,262,898
Net Therm Savings	36,654	86,285	86,285	209,224
Net kWh Savings	145,530	342,804	342,804	831,138
Net kW Reduction	122	286	286	695
VFD Pump Control Installations	45	106	106	257
Dual Set Point Controller Installations	45	106	106	257
Assumed Program Launch Date	1/1/2021			
Program TRC	1.06	Program PAC		1.06

4.0 Program Description

The Multi-Family (MF) customer segment is identified as a Hard-to-Reach (HTR) for the reasons described in SoCalGas's Business Plan. The objective of Multi-Family Space and Water Heating Controls (MF SAWH) Program is to surmount the dichotomy of split incentives and maximize energy efficiency measure installation in targeted MF apartment buildings that have the dual-function (Raydronics) central water heaters (water heating and hydronic space heating) through a Direct Install EE program. These systems were installed in the 1970s-1980s in Southern California. The patented, Dual Set Point Controller, tested and evaluated by SoCalGas ET program, for the Raydronics system lowers the storage tank temperature during summer season and during nights when space heating is not required and turns off the summer pump realizing significant energy savings (11%-25%).

Program proposes to leverage this effort with the installation of variable frequency drive (VFD) on the Raydronics system pump which results in additional savings. With these two measures, the program participants can reduce combined natural gas and electricity energy consumption in these types of apartment buildings as much as 15%-20%. The program is innovative in that it addresses the low EE program participation issue with HTR MF customer by utilizing a different approach. The approach is a Direct Install program that leverages the highly cost effective dual-function WH controller installation as a gateway to installation of other less cost-effective measures. The program addresses both space heating and water heating with ancillary savings in electricity use. This is a limited measure program. Program budget can climb exponentially if envelop, water and electricity measures are included, and program can become marginally cost effective or cost ineffective.

The program approach can be summarized as follows:

- Develop an intake form like the one that SoCalGas REN program implementers use.
- Conduct field surveys of potential customers before proposing a project site to SoCalGas.
- Identify the decision makers in the apartment building and speak directly with them.
- Conduct preliminary survey of the property to identify the eligibility of the property to participate in the program and inventory the potential measures.
- Gather building utility bills for the central water heating system which is usually separately metered.
- If SoCalGas advanced metering technology is installed, request 12-month consumption data for the meters after getting a data release form signed by the customer.
- Select the most qualified and honest installers for the program.
- Set up "best practice" standards for system installation and follow a quality assurance plan to ensure the highest quality installation of the technologies.
- Conduct post installation surveys and inspections to determine that quality assurance is high.
- Conduct follow up service visits to a random sample of sites to ensure that program reliability of savings is high.
- Conduct post installation customer satisfaction survey of sample of tenants and property owner.

- Issue a final report on the project which will include the EM&V results

Since the program does not impact building envelop and other measures that are dependent on climate, it is forgoing the use of computer modeling of the projects. Computer modeling utilizing multi-family centered versions of the Energy Pro model, Easy Retrofit Tool and Energy Pro Lite are incapable of properly simulating the Raydronics system. Therefore, the program will use a combination of calculated and metered data analysis to determine savings. Multi-family customers will respond to this program for the following reasons:

- The Direct Install program with zero cost will reduce their risk and exposure fully.
- Property owners will want to increase their profits and reduction of their water heating bill is an attractive option which can increase the bottom line.
- Owners can take credit for the GHG reduction due to the measures installed.

b) List of measures

This program is only targeting the common areas in a multi-family building. Since the primary measures impact central space and water heating, other measures that impact dwelling units or tenants are not included. However, the common area offices and clubhouse areas that have plumbing services, will be addressed with water saving measures.

Program Measures

#	Measure Name
1	VFD Pump Control on Water Heating System
2	Dual Set Point Controller
3	Pipe Insulation (Central Water Heaters)
4	*Faucet Aerator or Under Sink Flow Restrictor
*Faucet Aerators will only be installed if Under Sink Flow Restrictors are not feasible.	

c) List non-incentive customer services

Through this program, Contractor will do the following:

- Perform building central water and space heating audits at multifamily properties, identifying a comprehensive list of gas, electricity and water savings opportunities available at each property.
- Deliver education and training about the benefits of energy efficiency and proper maintenance to property owners and managers.
- Provide SoCalGas’s other multifamily energy efficiency program(s) materials and contact information to multifamily property owners and managers, as appropriate.

- Provide potential customer lead opportunities for additional services to other programs, such as SoCalGas's REN contacts and its utility run programs.

5.0 Program Rationale and Expected Outcome

The rationale for the program is as follows:

- Utilities have found it hard to market to these MF customers.
- The Dual Set Point controller for the Raydronics systems is an underutilized technology and property owners could benefit from their installation and save significant amount of energy.
- Apartment building owners do not have enough knowledge to appreciate that properly controlled hot water storage type boiler can save energy. These owners do not have the technical knowledge or the financial acumen to determine the cost effectiveness of installing energy efficiency measures.
- Many of the apartments are in densely populated inner cities where tenants are not educated and have language barriers, there is little incentive for owners to upgrade to higher efficient equipment.
- Many water heater and boiler service companies do a poor job in marketing their service and most small owners are suspicious of them.
- The larger apartment building owners/property management firms are too removed from their facilities to be aware of the energy options. The water heater/boiler service companies do not have contact with the decision makers.
- With rising utility bills and competitive nature of the business, many of these firms do not have the capital to install EE measures that have long simple paybacks.
- The maintenance staff of these larger properties do not have the knowledge, or the time to understand the EE choices.

This program is planning to address these problems and perception among property owners and firms. Program will also show them calculated savings in energy and carbon. In order to build awareness of the technologies and their benefits related to the program, there will be marketing materials such as brochures that illustrate sample costs and savings, describe the conversion process and its benefits, reliability, persistence and announcement of the program.

a) Quantitative Baseline and Market Transformation Information

This section is not applicable.

b) Market Transformation Information

This section is not applicable.

c) Program Design to Overcome Barriers

The barriers that have been identified in previous years are:

Challenge 1: Whole House retrofits are too costly for customers and the current program design is cost-ineffective.

This is a Direct Install program design with zero cost to the participant which will ensure full participation by the customer.

Challenge 2: Low participation across residential sector, especially in the multi-family segment.

As stated in earlier sections, the program addresses the above issues. The lack of capital funds and long simple paybacks of EE measures is addressed through the Direct Install program.

Challenge 3: Performance Uncertainty

Performance uncertainty and lack of confidence will be addressed through the “deemed” measure Direct Install program with SoCalGas followed by solid documentation of savings through an M&V plan and a final report.

d) Quantitative Program Targets

The program targeted goals are identified the table in Section 3. The target goals for the pipe insulation, flow aerators and under sink flow restrictors are difficult to quantify and will be addressed once site visits are made to determine existence and numbers of plumbing fixtures encountered in the common areas.

e) Advancing Strategic Plan goals and objectives

The program is aligned with SoCalGas’s first three Business plan goals and first two of the challenges identified for the Residential Sector. The goals, challenges and how the program addresses them are as follows:

Goal 1 Achieve comprehensive, deep energy efficiency levels through a whole house approach. The program, although not a complete whole house program, does address multiple end uses which are water heating and space conditioning. In addition, the energy audit will take a whole house/building approach to identify other EE measures for dwelling units and common areas.

Goal 2 Increase energy efficiency adoption levels for all residential customers with a focus on multi-family customers with high potential through efficient outreach and effective offerings. Program targets a section of multi-family customers with high EE potential through a channel of direct contact and offering a Direct Install program to ensure high participation level.

Goal 3 Increase adoption of energy-efficient gas appliances and energy management devices. The program will investigate if smart thermostats is a potential measure that will empower the building tenants to manage their energy use and reap savings in both natural gas and electricity.

6.0 Program Implementation

a) Statewide IOU Coordination

This is a third-party program which operates within SoCalGas's service area. The Program is designed to support and complement SoCalGas's core program activities. Program contractor will work with SoCalGas's program staff to determine if the program can be offered to complement any of the utility's residential multi-family programs. In addition, if this program can be offered in other IOU service territories, the contractor will work with SoCalGas in coordinating the effort.

b) Program delivery and coordination

This program is a Direct Install, third-party energy efficiency program. It is not an Emerging Technologies program, a Codes & Standards program or a Workforce Education & Training program.

c) Program marketing and outreach efforts

Program marketing budget is shown in the budget table in Section 3. Program is budgeting appropriately for the marketing effort. Plan is to develop two types of marketing material to market the program. They are as follows:

- Contractor will have program pamphlets to be provided to the property management staff and manager in the targeted property.
- Contractor will also develop educational material for the apartment tenants on tips to save energy. This will include both behavioral strategies as well as energy and water using equipment operational strategies and steam heating energy. These tips will be offered through pamphlets in the rental office, bulletin boards, community centers, elevators, laundry rooms and community newspaper to reach the families. This document may be bi-lingual or multi-lingual.

Expected Program marketing materials shall include:

- o Program brochure
- o Energy efficiency benefit sheet
- o Operations and maintenance best practices
- o List of other available utility programs (from SoCalGas)
- o Case studies (past studies done by contractor)
- o Guide to energy efficiency in the multifamily market (from SoCalGas)
- o Rebate application forms for other SoCalGas programs
- o Program contact information

d) Non-energy activities of program

Not applicable to this program.

e) Non-IOU Programs

Contractor will identify a list of measures that each property may install to achieve further efficiencies, including gas, electricity and water, both utility and non-utility sponsored. Non-utility programs include local government, state agencies and US government agency sponsored programs. Contractor will work closely with SoCalGas on this effort. Some of the energy efficiency measures that could potentially be considered for informing the participating customer are as follows:

- Boiler/Water Heater tune-up
- High-efficiency gas central water heaters and boilers
- High-efficiency dishwashers
- High-efficiency forced-air units and replacement filters.
- Insulation in the walls, attics and floors
- Water heater tank and pipe insulation
- Weatherstripping and caulking
- Low-flow toilets and shower heads
- ENERGY STAR qualified ceiling fans
- LED lighting
- LED exterior lighting.
- High-efficiency refrigerators
- Water-saving sprinkler timers
- High-performance dual-pane windows
- High efficiency clothes washers and dryers

f) CEC PIER and Codes and Standards funding

Not applicable to this program.

g) Non-utility market initiatives

Not applicable to this program.

7.0 Program Innovation

Proposed program is innovative in nature for the following reasons:

- The program measures include emerging technologies such as the Dual Set Point Controller developed for the “Raydronics” system, the use of VFD Pump for central space and water heating systems. Both technologies have been tested by SoCalGas ET

- MF customers are hardest to recruit because of the” split incentive” challenge. Therefore, a direct marketing method is used to contact the property owner and personal contact for a “no cost” install program to execute comprehensive EE measure installation in the apartment building.
- Documentation and testimonials from the first customers that participate will be used to procure new customers through project reports and communication through conference calls or if necessary, tours of the participating by prospective customers.

8.0 Program Delivery

Contractor is proposing a Direct Install program with zero cost to the participant to overcome the cost barrier to EE measure installation in multi-family properties. Program delivery mechanism will be as follows:

- Target market is SoCalGas’s residential market.
- Program will only be directed to those apartment complexes that have the Raydronics system installed. A single property may have one or more buildings with these systems installed. Average number of apartments served the Raydronics system is assumed to be 40-45 units. Contractor will only target the larger building with 30 or more apartments per system to ensure cost effectiveness.
- Program will be marketed to counties of Orange (CTZ 8) Los Angeles (CTZ9), Riverside & San Bernardino (CTZ 10) and S. Barbara (CTZ6) areas within SoCalGas service territory.
- Program will be marketed directly to the on-site property manager and the management company. Contractor has close relationship with most of the property management firms.
- The primary program strategy to deliver the energy savings will be a combination of metered and calculated method. Please see section on program M&V for more information on how this will be done.
- Contractor will develop a program collateral announcing the Direct Install nature of the program and its goal of number of installations along with technologies being marketed and sample project savings. The dual set point controller for the Raydronics system is manufactured and installed by Contractor.
- This direct marketing to the property owners and product manufacturers will get their immediate attention and result in quick decision making by the property owners and enable contractor to get deep discounts from technology providers.

9.0 Program Process and Logic Diagram

Figures 1 and 2 illustrate the Program Process flowchart and the Program Theory & Logic Model

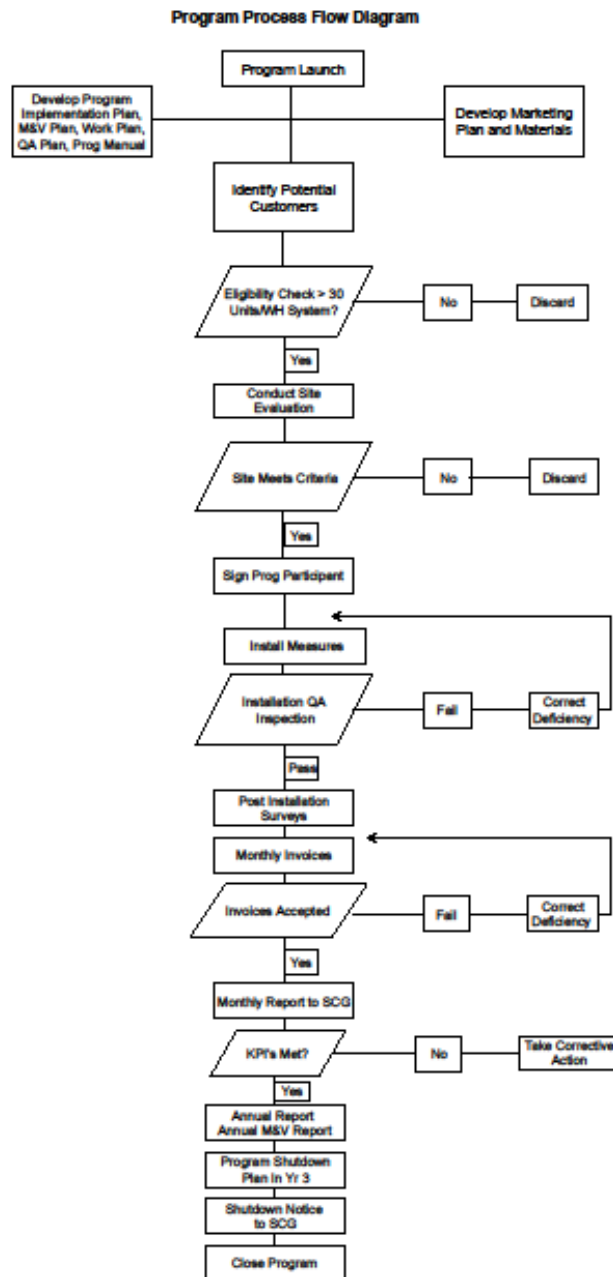


Fig 1 – Program Process Diagram

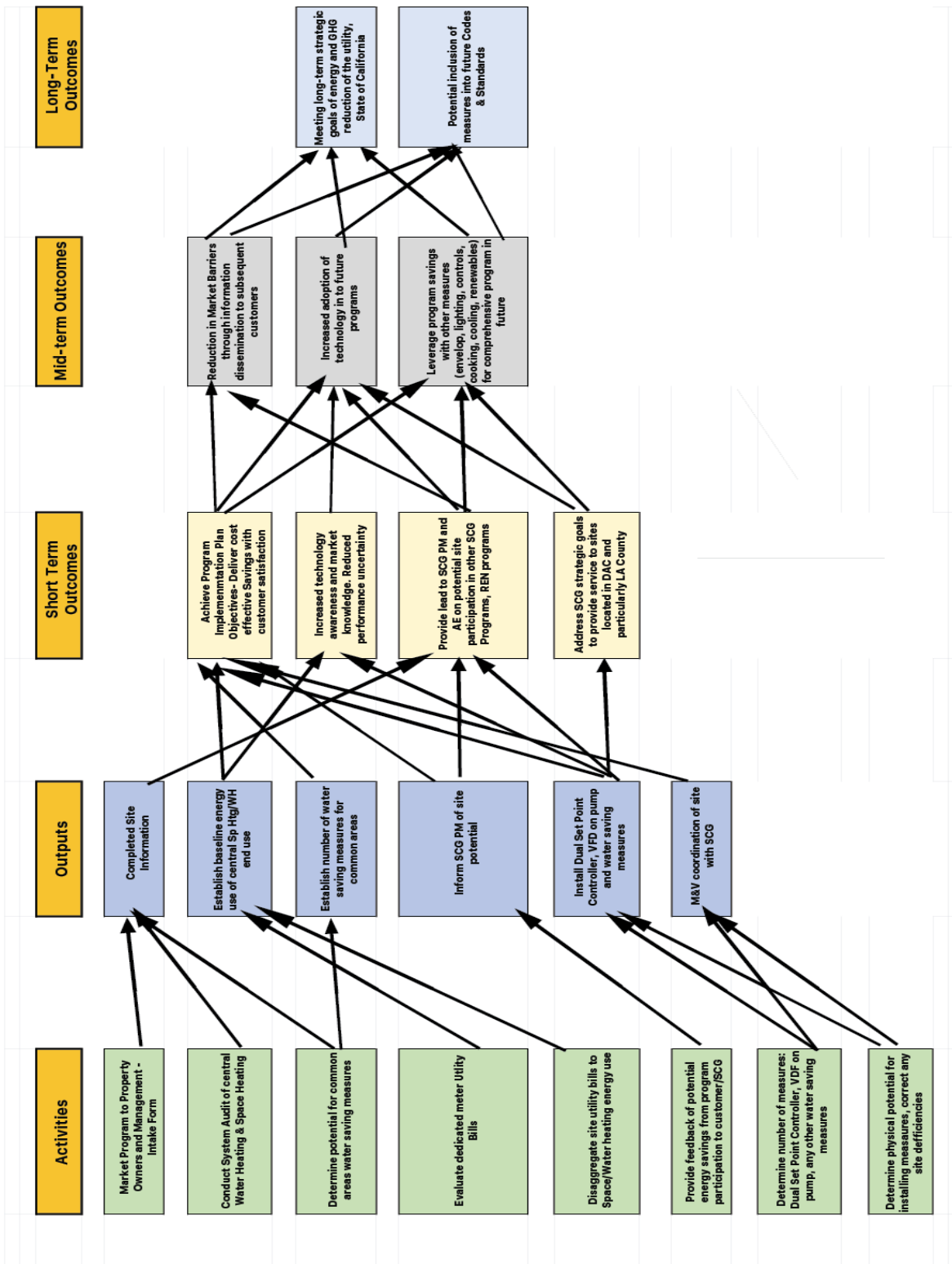


Fig 2 Program Logic Model

10.0 Program Design and Best Practices

This program is designed as a Direct Install program. It is narrowly focused on delivering just two (2) major EE measures to a niche market segment within the multi-family residential customer of SoCalGas. The program will only focus on those properties that have the Raydronics system installed. The Dual-Set Point controller for the Raydronics system reduces energy use. The controller along with a new VFD control for the loop pump can reduce energy consumption significantly.

Program is pursuing an innovative set of strategies and tactics to achieve the program goals and savings. They are as follows:

- Reduce first cost barriers to technology installation by offering a Direct Install program
- Person-to-person customer contact as opposed to mass mailings or web design on features. This is an efficient and cost-effective means to reach the customer very quickly and get his/her verbal agreement to participate.
- Contractor has identified a market trend in that many property owners are currently exploring ways to reduce the carbon footprint of their properties. This program will enable them to get credit for GHG reduction.

Contractor will use the energy efficiency savings experience and project report of the first customer participants to market to the next customer through testimonials and telephone and conference calls to get customer attention to the program and get rapid procurement of customers.

11.0 Quality Assurance Approach

Contractor will institute a rigorous quality assurance plan to meet these RFP requirements. To achieve this, we shall require that:

- Workmanship is of the highest order. Every installation will be inspected to check if manufacturer recommended practices are being followed.
- Ensure that installed technology is operating as expected and revisit sites if necessary, to further adjust for proper operation.
- Detailed record keeping of all purchase orders, invoices, receipts, pay checks, expenses and other financial documents are maintained.
- All customer data is stored in a secured manner.
- Energy surveys are done in a professional manner.
- All reports to the utility and the CPUC are done in a timely manner and accurately.
- Prompt response to customer complaints and service calls for warranty or guarantee.
- Billing is done for actual work performed and there is no miss management of funds.
- Maintain all files for the program in a secure manner.
- Respond to any audits and enquiries by SoCalGas.

Contractor will develop a program Quality Assurance Plan as part of the Program Plan.

12.0 Program Measurement & Verification (M&V)

Although a Direct Install program that is based on “Deemed” savings, Contractor and SoCalGas has agreed to conduct a limited M&V effort to quantify actual savings of the measures as Contractor’s own field test experience shows that energy savings from the measures can be much higher than the “Deemed” savings.

Contractor’s M&V subcontractor will draft an M&V plan for the project, detailing all items to be measured or stipulated, the source of all measurements and its accuracy and sensitivity, all assumptions, how missing or bad data will be handled, the duration of all measurements, the equations to be used to estimate energy savings (if requested), and how any baseline adjustments will be handled (if requested).

Approach is to assure that all monitoring data is collected correctly, and to minimize the potential of delays on the completion of the project or completing the project with suboptimal data sets. Contractor will meet with the SoCalGas project manager to determine the scope of the monitoring, the desired results, the measurement and verification (M&V) plan, and the required M&V protocol. Items that will be identified in the M&V plan include:

- The systems and equipment that will be monitored and the types of sensors and equipment that will be required to complete the task.
- The calibration and accuracy requirements for the monitoring data.
- Identification of the equipment that will be used to collect the monitoring data, and where the equipment will be obtained, either in house equipment, or loaned through SoCalGas’s Lending Library or leased equipment.
- The interval for recording readings and the monitoring period.
- Whether and how the monitoring data will be extrapolated to a full year, using weather, or other data, and how this data will be obtained.
- Whether the customer’s building management system (BMS) is compliant with the OpenADR 2.0 protocol.

After the M&V plan is prepared, the plan will be provided to the SoCalGas project manager for comment and approval. After the project manager has approved the monitoring and instrumentation plan, contractor will coordinate with the SoCalGas project manager to contact the site to set up the installation of the monitoring equipment, data collection, and retrieval of the monitoring equipment.

Contractor will coordinate with SoCalGas’s project manager to collect any data from existing monitoring equipment or other relevant information required to interpret and extrapolate the data, as appropriate. Contractor will obtain any required monitoring equipment and program the equipment.

A complete M&V plan will be submitted along with Program Plan to SoCalGas.