

**2013-2014 Energy Efficiency Programs
SaveGas Hot Water Control with Continuous Commissioning
Program Implementation Plan**

- 1. Program Name:** SaveGas Hot Water Control with Continuous Commissioning
Program ID: SCG3766
Program Type: Third-Party Program

2. Projected Program Budget Table

Table 1: Total Projected Program Budget by Category

Program #	Main/Sub Program Name	Administrative Amount	Marketing Amount	Direct Implementation Amount	Incentive Amount	Total Program Budget Amount
	SoCalGas Third Party Programs					
3766	3P-SaveGas	\$0	\$0	\$594,168	\$385,833	\$980,001
3766u	3P-SaveGas (Utility)	\$17,806	\$7,661	\$41,864	\$0	\$67,331
	TOTAL:	\$17,806	\$7,661	\$636,032	\$385,833	\$1,047,332

Note: SCG continues to negotiate the final contract with the third party vendor. As a result of final contract negotiations, the budget allocation into the budget subcategories may vary.

3. Projected Program Gross Impacts Table

Table 2: Total Projected Program Savings by Subprogram

Program #	Main/Sub Program Name	2013-2014 Gross kW Savings	2013-2014 Gross kWh Savings	2013-2014 Gross Therm Savings
3766	3P-SaveGas	0	0	515,255
	TOTAL:	0	0	515,255

Note: The therm savings are estimated based on contract negotiations with the third party vendor. The projected savings may change as a result of final contract negotiations.

4. Program Description

a) Describe program

This program addresses gas savings in SoCalGas's service territory by implementing domestic hot water (DHW) control systems in hotels, motels, resorts and senior care facilities plus other associated hot water end uses. (e.g. on-site kitchen and laundry facilities). A typical equipment arrangement consists of a hot-water storage tank, a hot-water boiler which includes a circulation pump, a loop or network of piping to supply the heated domestic hot water to the facilities guest rooms / dwelling units, and a recirculation pump on the return line from the piping loop.

Almost every DHW system has deficiencies and system malfunctions which result in excess use of natural gas for water heating. Wasted energy from water heating can be as high as 119 therms per hotel room.

The controller will help identify existing system malfunctions as well as system malfunctions occurring during the life of the controller. The programmable setback feature has demonstrated to save additional therms per hotel room annually.

The Program will implement three process improvement components:

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- Sensors and Data loggers – The maximum thermostat set point of DHW systems in hotels and motels is usually set too high because of system inefficiencies and malfunctions. Such system inefficiencies and malfunctions are frequently identified only after the installation of a variety of sensors and a data logger. The data can be retrieved remotely or on-site. Once the inefficiencies and malfunctions are identified and corrected, the maximum thermostat set point can be reduced. The DHW system will still provide the minimum required hot water temperature to the rooms, but with significant energy savings.
- Set-Back DHW Thermostat Controller – This energy savings measure is to install a programmable set-back temperature controller on the DHW system. A programmable set-back controller saves energy by lowering the DHW thermostat setting during times of low DHW usage. The controller can be programmed remotely or on-site.
- Continuous Commissioning[®] – By using continuous commissioning of energy consumption and system parameters long-term energy savings will be maintained. Without continuous commissioning taking place, new system problems can continue for months without being detected and repaired. Continuous commissioning is an essential part of the long-term gas savings from DHW thermostat controllers.

Targeted market penetration levels will be achieved through specific elements:

- Increased customer awareness about existing energy use and practices;
- Increased understanding of technical options and financial impacts related to energy efficiency building improvement strategies, and
- Increased comprehensiveness of projects implemented due to the unbiased and vendor-neutral information on the best operating practices and equipment upgrades

The SaveGas Hot Water Control program is 100% complimentary to other programs. As far as delivery and implementation, all efforts are conducted directly by Program personnel without the use of subcontractors.

Customers will participate in a web-based interactive presentation which uses as an example technology on similar facilities to those installed (size and plumbing configuration). During this presentation the customers learn how they will be able to validate the ongoing savings and how to use the system as a management tool allowing proactive monitoring and verification.

Facility Pre-installation Analysis/Audit

After the customer provides a list of properties, technicians perform an onsite survey of the hot water systems looking for existing issues (e.g., system layout, applicability and proper installation and operation of the existing equipment). A general analysis of the property is completed including gas consumption history, and general building layout. The information is captured and logged online.

Proposal

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Based on the pre-installation analysis, a proposal is generated for the property. The proposal states the minimum savings that will be achieved, the ongoing economic value, return on monthly investment, net savings, payback period, etc. The customer is informed that the Contractor equipment will be installed at no cost to the customer. However, the customer is then provided the option to enroll in the continuous monitoring service at a cost of \$1.00 per room. This service includes data analysis/tracking, consulting and control maintenance and updates; however, the customer is not required to purchase this service in order to install the controllers.

Installation of Equipment

After the contract has been authorized, installation of the equipment takes place. Installation includes the Contractor's DHW controllers, Contractor's computer(s) and Contractor's proprietary communication network. All of the equipment, installation and configuration settings are logged online. At this point in the process the controls are set up just to monitor and establish a baseline/benchmark of the customer's facility.

On-site training takes place in which the installation technician provides an overview of how the technology works, how to bypass the computer in case of an emergency and how to go online for systems analysis. Additionally property contact information is captured so that the system can notify the appropriate onsite personnel should a hot water issue be detected.

Commissioning the Contractor's Control Systems

Once a period of baseline operation has been established and recorded (approximately two weeks), the system is commissioned for operation. This entails switching the Contractor's computers into control mode and adjusting delivery temperatures to provide optimal operation for the facilities equipment.

Contractor's administrative personnel conduct formal training for the property and management. During this training the SaveGas website is configured so that customers can go online and view their data, analyze their site and set themselves up to receive alerts for hot water issues.

Ongoing Savings, Monitoring and Verification

The controllers provide ongoing savings and the monitoring and verification tools track the overall system performance and savings looking for deviations that might interrupt or impede the savings or system efficiency.

Record Retention Procedures

Records include customer contract data, installation information, the data acquired during baseline/benchmarking periods as well as data acquired and system malfunctions identified and repaired over the life of the installation.

The Program's technology provides proven savings with constantly verifiable data that the technology is in place and operational. This capability is the latest trend in energy conservation, and having a third party utility program directly validates the technology and economics.

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b) List measures

The Program will implement specialized technology that includes three process improvement components: Sensors/Data loggers, Set-Back DHW Thermostat Controller and Continuous Commissioning.

Measure	Incentives (per unit)
DHW - res	\$28.74
DHW - com	\$28.74
DHW - com laundry	\$1,500

c) List non-incentive customer services

The Program will also provide continuous commissioning service, customer education, data analysis/tracking, consulting and control maintenance and updates.

5. Program Rationale and Expected Outcome

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

Customers are often unaware that their water heater systems are malfunctioning. In addition, there is often customer resistance to install new technologies due to dissatisfaction with previously installed technologies that failed or resulted in operational issues.

This program will implement a hot water controller with a programmable setback feature to help identify existing and future system malfunctions and control gas consumption.

To overcome resistance to new technologies, the Program will not target individual property owners but rather will target those who own and manage portfolios of properties as “assets”. In typical installations, the program will retrofit all of the hot water systems where the technology is applicable, corporate wide. This allows participants to manage the hot water systems, and thus achieve consistent savings within the entire portfolio of properties. This is accomplished from a central or remote location via an asset manager who is incented to grow asset value (savings).

In addition, Contractor will offer a continuous commissioning service which consists of automated monitoring and analysis of the DHW system performance at all time, along with prompt notification of system malfunctions to the owner/operator of the facilities. This will help encourage continuing awareness of system performance and help increase customer acceptance of the new technology.

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Barrier	Solution
Lack of consumer information about energy efficiency benefits	Continue to educate target market on benefits of DHW technology for long-term energy savings
Lack of financing for energy efficiency improvements	Technology installation cost is incurred by program – no first cost for customer
Lack of a viable and competitive set of providers of energy efficiency services in the market	This specific technology is unique and as such EDC is the only provider. Continue to aggressively market the product to target market
OTHER BARRIERS	
The models developed for assessing usage are often confusing to financiers & managers. Need to be expressed in plain English,	This program provides a comprehensive baseline test period that culminates in a thorough energy analysis. A report is provided to the customer and explained in detail so the customer can understand the importance of the controller system

d) Quantitative Program Targets

Table 3

Program Name	Program Target by 2013	Program Target by 2014
SaveGas Hot Water Control with Continuous Commissioning # of Properties	10,000 rooms/ approximately 100 properties	10,000 rooms/ approximately 100 properties
SaveGas Hot Water Control with Continuous Commissioning # of Laundry / Kitchens	30	30

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e) Advancing Strategic Plan goals and objectives

This Program supports the Strategic Plan in the following manner:

Description	Strategic Plan Sector	Strategic Plan Goal	Strategic Plan Strategy
Program is participating directly in the CEC-PIER program and technology is being utilized directly for establishing Title 20 and Title 24 guidelines.	Residential	Deliver Zero Net Energy New Homes By 2020.	1-1: Drive continual advances in technologies in the building envelope, including building materials and systems, construction methods, distributed generation, and building design.
On site training takes place in which the installation technician provides an overview of how the technology works, how to bypass the computer in case of an emergency and how to go online for systems analysis	Workforce Education & Strategy	Establish energy efficiency education and training at all levels of California's educational system.	1-3: Incorporate energy efficiency and demand side energy management into traditional contractor and technician training, such as for plumbers and electricians, and expand training resources to produce target numbers of trained workers.
Direct program involvement of the technology's manufacturer helps lead to increased development and utilization of energy-efficient products and services and implement activities that create favorable conditions for EE technology investment and development.	Research & Technology	Create demand pull and set the research agenda to pursue both incremental and game changing energy efficiency technology innovations.	1-2: Leverage private industry and Federally funded technology research and investment
Through program, Contractor works collaboratively with the R&D community and utilities to promote cost-effective performance enhancements.	Research & Technology	Conduct targeted emerging technologies R&D to support the Big, Bold Energy Efficiency Strategies/Programmatic Initiatives and integrated energy solutions goals.	2-2: Promote cost-effective near term performance enhancements of existing technologies
Through statewide collaborations and active participation in the CEC's PIER program, Contractor through this program expands activities that support Big Bold initiatives.	Research & Technology	Conduct targeted emerging technologies R&D to support the Big, Bold Energy Efficiency Strategies/Programmatic Initiatives and integrated energy solutions goals.	2-3: Develop initiatives aimed at PIER to support larger gains in support of Big Bold Initiatives.

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6. Program Implementation

a) Statewide IOU Coordination

- i.** Program name
- ii.** Program delivery mechanisms
- iii.** Incentive levels
- iv.** Marketing and outreach plans, e.g. research, target audience, collateral, delivery mechanisms.
- v.** IOU program interactions with CEC, ARB, Air Quality Management Districts, local government programs, other government programs as applicable
- vi.** Similar IOU and POU programs

This third-party program only operates within SoCalGas's service area. The Program is designed to support and complement SoCalGas's core program activities. If this Program shares common elements with the IOU's core programs, other third-party programs, or programs in other IOU service areas, SoCalGas and the Contractor will strive to coordinate the similar activities.

b) Program delivery and coordination

- i.** Emerging Technologies program
This is not applicable to this program.
- ii.** Codes and Standards program
This is not applicable to this program.
- iii.** WE&T efforts
On-site training takes place in which the installation technician provides an overview of how the technology works, how to bypass the computer in case of an emergency and how to go online for systems analysis. Additionally property contact information is captured so that the system can notify the appropriate onsite personnel should a hot water issue be detected.

Contractor's administrative personnel conduct formal training for the property and management. During this training the SaveGas website is configured so that customers can go online and view their data, analyze their site and set themselves up to receive alerts for hot water issues.

- iv.** Program-specific marketing and outreach efforts (provide budget)
- v.** Non-energy activities of program
This is not applicable to this program.
- vi.** Non-IOU Programs
This is not applicable to this program.

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vii. CEC work on PIER
This is not applicable to this program.

viii. CEC work on codes and standards
This is not applicable to this program.

ix. Non-utility market initiatives
This is not applicable to this program.

c) Best Practices

The program design incorporates various best practice elements. Specific items include:

- Program Management - Project Management: Program uses well-qualified engineering staff.
- Program Management - Reporting and Tracking: Through detailed recording of installations and operating parameters, the program has a well-designed program tracking system to support the requirements of evaluators as well as program staff.
- Program Implementation – Marketing and Outreach: The program sells the customer benefits first, then energy efficiency and keeps benefits quantifiable in economic terms.

Lessons learned is that customers are very open and eager to embrace programs that are supported and successful. Most of the installations done under the 2006-2008 program were exploratory in nature (to verify the technology). Now that things have been verified, customers are looking to expand the program.

d) Innovation

Control technologies are not new; however, the Program's user interface is new and innovative. Through the Program's technology, customers are kept 100% aware of the savings they are achieving and any energy waste that may be occurring as a result of hot water system issue, failures, etc. Through this interface, energy conservation is now elevated to become an integral part of daily operations as opposed to a concept or widget that is installed and forgotten.

e) Integrated/coordinated Demand Side Management

The savings data generated from the SaveGas Hot Water Control with Continuous Commissioning program is being directly used by CEC/PIER in a statewide study. Additionally the Program's contractor has been directly consulted as a result of the data, market penetration and experience in helping to craft title 21 and title 24 codes and standards.

When Contractor technicians perform an onsite survey of the hot water systems, they will often encounter additional energy savings opportunities beyond the scope of the Contractor DHW program. The opportunities will be noted and relayed to Contractor's primary contact within the customer organization.

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f) Integration across resource types (energy, water, air quality, etc):

This program does not integrate across resource types.

g) Pilots

The Kitchen and Laundry components are pilot projects. The environment for Laundry and Kitchens is identical to that of other DHW applications and preliminary data is showing similar savings results.

h) EM&V

The utilities are proposing to work with the Energy Division to develop and submit a comprehensive EM&V Plan after the program implementation plans are filed. This will include process evaluations and other program-specific studies within the context of broader utility and Energy Division studies. More detailed plans for process evaluation and other program-specific evaluation efforts cannot be developed until after the final program design is approved by the CPUC and in many cases after program implementation has begun, since plans need to be based on identified program design and implementation issues.

7. Diagram of Program

No specific program diagram for this third party program has been developed. Any program linkages are discussed in Section 6.

8. Program Logic Model

Third party programs are an implementation channel and are included in the appropriate market segment logic models. No specific logic model for a particular third party program has been developed. However, provided below is a diagram of the Program's implementation.

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