

Title:

**UPSTREAM HIGH EFFICIENCY GAS WATER HEATER
PROGRAM FOR PG&E SERVICE TERRITORY**

Submitted to:

**California Public Utilities Commission
R.01-08-028
2004/2005 Non-Utility Energy Efficiency Program Selection**

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Other Programs Proposed:

**Upstream High Efficiency Gas Water Heater Program
for SoCalGas Service Territory**

**Upstream High Efficiency Gas Water Heater Program
for SDG&E Service Territory**

Mobile Energy Clinic Program for PG&E Service Territory

Mobile Energy Clinic Program for SCE Service Territory

Mobile Energy Clinic Program for SoCalGas Service Territory

Mobile Energy Clinic Program for SDG&e Service Territory

**Beverage Vending Machines Energy Savings Program
for PG&E Service Territory**

**Beverage Vending Machines Energy Savings Program
for PG&E Service Territory**



TABLE OF CONTENTS

<i>Section</i>	<i>Title</i>	<i>Page</i>
I.	Program Overview	1
II.	Program Process	3
III.	Customer Description.....	14
IV.	Measure and Activity Descriptions	16
V.	Goals.....	18
VI.	Program Evaluation, Measurement and Verification	19
VII.	Description of ADM's Qualifications	22
VIII.	Budget	32

I. PROGRAM OVERVIEW

I.A PROGRAM CONCEPT

ADM Associates, Inc. (ADM) proposes to implement an Upstream High Efficiency Gas Water Heater Program as a Local Nonresidential Energy Efficiency Program in PG&E's service territory for Program Years 2004 and 2005. The Upstream High Efficiency Gas Water Heater Program that we are proposing is a continuation and extension of the program that ADM implemented in PG&E's service territory during 2002/2003. The Upstream High Efficiency Gas Water Heater Program is aimed at increasing demand for and expanding sales of high efficiency gas water heaters (i.e., gas water heaters with an energy factor of 0.62 or higher) in the residential replacement market. This is accomplished by providing incentives to participating wholesalers to encourage them to purchase, inventory, and promote these water heaters. Water heaters sold for new construction are excluded from the program.

I.B PROGRAM RATIONALE

We are proposing the Upstream High Efficiency Gas Water Heater Program as a hardware/incentive program. The rationale underlying the Upstream High-Efficiency Gas Water Heater Program is that the most effective way to increase the sales of higher efficiency gas water heaters to households is by working with manufacturers, wholesaler/distributors, water heater dealers, and plumbing contractors. High-efficiency gas water heaters are promoted through the program by providing incentives to stock and sell such units to wholesalers/dealers, who in turn discount the price of the units when selling them to plumbing contractors. Only water heaters sold for residential replacement purposes receive the discounts; water heaters sold for new construction do not receive the discounts.

For the most part the Upstream High Efficiency Gas Water Heater Program is patterned on similar programs that we have implemented (e.g., a program for Southern California Gas from 1999 through 2001, and a local non-utility program that we implemented in PG&E's service territory during 2002/2003). However, there have been two major changes in the market environment for water heaters, and we have modified our proposed Upstream High Efficiency Gas Water Heater Program to accommodate these changes.

- The American National Standards Institute (ANSI) has developed a new standard that addresses the accidental or unintended ignition of flammable vapors. This new standard took effect on July 1, 2003. The cost of meeting this standard has increased the price level for gas water heaters by about 50%.
- A new federal standard for water heater efficiency, which will take effect in 2004, increases the minimum acceptable energy factor for gas water heaters to 0.58.

Because of these changes, we propose to increase the incentive that we pay to wholesalers and to increase the energy factor for water heaters that qualify for the program. Wholesalers participating in the Upstream High Efficiency Gas Water Heater Program are offered a \$14 per water heater incentive to stock high efficiency gas water heaters (i.e., water heaters with energy factors of 0.62 or higher). Of this \$14 incentive, \$10 is to be passed along as an over-the-counter discount to the plumber and \$4 can remain with the wholesaler to cover his administrative costs. To be eligible for discounts through the program, a water heater must have an energy factor of 0.62 or higher.

I.C PROGRAM OBJECTIVES

Table I-1 provides summary information on the objectives for the proposed Upstream High-Efficiency Gas Water Heater Program.

Table I-1. Proposal Summary for Upstream High-Efficiency Gas Water Heater Program

Program Name	Upstream High-Efficiency Gas Water Program
Utility Service Territory	PG&E
Program Type	Upstream and Rebates
Target Sector	Residential SF
Performance Target	32,000 high efficiency gas water heaters rebated
Annual kWh Savings Target	N/A
Annual Peak kW Reduction Target	N/A
Annual Therm Savings Target	421,630 therms
Total Program Budget	\$749,000
TRC	3.26
PT	11.81

The Upstream High-Efficiency Gas Water Heater Program accomplishes a number of other objectives.

- It addresses a major market barrier for improving energy efficiency for water heaters (i.e., the lack of interest by plumbing contractors).
- It is cost effective in the savings it provides per dollar of cost.
- It is innovative, using an upstream marketing approach to make installation of higher efficiency gas water heaters more attractive to plumbing contractors.

II. PROGRAM PROCESS

II.A PROGRAM IMPLEMENTATION

Our process for the proposed Upstream High-Efficiency Gas Water Heater Program builds directly on the process and procedures that we have used since 2001 in implementing this program in the service territories of Southern California Gas Company and Pacific Gas and Electric Company. We already have in place all of the personnel, equipment, and procedures needed to operate the Upstream High-Efficiency Gas Water Heater Program in PG&E's service territory during PY 2004 and PY 2005.

Our work effort in implementing the Upstream High Efficiency Gas Water Heater Program includes the following:

- Conduct market research and program planning;
- Identify and qualify wholesalers/distributors for the programs;
- Train and support the wholesalers/distributors;
- Verify sales of water heaters through the program and make payments to wholesalers/distributors;
- Promote high-efficiency gas water heaters through the program; and
- Coordinate the program with other partners.

II.A.1 Conduct Market Research and Program Planning

As noted above, our program plan for the Upstream High Efficiency Gas Water Heater Program is based on the work that we have already accomplished in implementing an upstream gas water heater program in the service territory of Southern California Gas Company. We have already conducted considerable market research for that program (through focus groups and surveys) and have three years of actual experience in implementing and fine-tuning that program.

Our market research and program experience revealed that the replacement market for gas water heaters has a variety of actors. The key players include manufacturers, distributors, wholesalers, retailers, plumbers, landlords and end-users. However, there are differences in the degree to which a program can influence these different players.

- While plumbers often have a central role in deciding on what gas water heaters to install, the research results indicate that focusing a program on them directly is not warranted. Traditionally, plumbers have purchased lower efficiency models because a greater price difference existed and because the exterior diameter of lower efficiency units is smaller, allowing easier installation in tight spaces. Plumbers do not want to carry a water heater to a job site and find out it won't fit, so they typically have carried low efficiency units to most job sites. Our market research work indicated that if

plumbers are required to handle much paperwork (e.g., if they are used as the central agents for the program), then their participation will be low. On the other hand, we also learned that plumbers will drive out of their way to purchase heaters from a wholesaler if a T-shirt, hat or BBQ lunch giveaway was happening.

- Our market research revealed that plumbing contractors working on new new construction projects generally install high efficiency water heaters to take advantage of Title 24 provisions. Accordingly, we determined that no incentives should be paid for high efficiency water heaters being used in new construction projects.

In positive terms, our market research revealed that the most effective way of affecting the water heater market was by working at the wholesale level. Based on the research, we developed a program design through which wholesalers participating in the Upstream High Efficiency Gas Water Heater Program were offered incentives to stock high efficiency gas water heaters.

By offering these rebates as incentives to wholesalers to lower prices on higher efficiency gas water heaters, we were able to encourage plumbing contractors to purchase and install higher efficiency gas water heaters. According to participants in focus groups that we conducted as part of the market research for our earlier programs, some plumbers had become proactive in asking homeowners questions to determine whether they could install higher efficiency units (even in situations where space considerations previously were considered a limitation on using higher efficiency units).

For the most part the Upstream High Efficiency Gas Water Heater Program that we are proposing to implement in PG&E's service territory during 2004/2005 is patterned on our earlier programs. However, there have been two major changes in the market environment for water heaters, and we have modified the design of our proposed Upstream High Efficiency Gas Water Heater Program to accommodate these changes.

- The American National Standards Institute (ANSI) has developed a new standard that addresses the accidental or unintended ignition of flammable vapors. This new standard took effect on July 1, 2003. The cost of meeting this standard has increased the price level for gas water heaters by about 50% (by about \$60-\$70 per unit).
- A new federal standard for water heater efficiency, which will take effect in 2004, increases the minimum acceptable energy factor for gas water heaters to 0.58.

Because of these changes, we propose to increase the incentive that we pay to wholesalers and to increase the energy factor for water heaters that qualify for the program. Wholesalers participating in the Upstream High Efficiency Gas Water Heater Program are offered a \$14 per water heater incentive to stock high efficiency gas water heaters (i.e., water heaters with energy factors of 0.62 or higher). Of this \$14 incentive, \$10 is to be passed along as an over-the-counter discount to the plumber and \$4 can remain with the

wholesaler to cover his administrative costs. To be eligible for discounts through the program, a water heater must have an energy factor of 0.62 or higher.

II.A.2 Recruit Wholesalers/Distributors

One of the most critical aspects to having the Upstream High Efficiency Gas Water Heater Program succeed is to recruit a large number of wholesalers/distributors into the program. However, because we implemented the Upstream High Efficiency Gas Water Heater Program in PG&E's service territory during 2002/2003, we have already recruited a majority of the water heater wholesalers serving that territory to participate in the program. For implementation of the 2004/2005 program, we continue to work with these wholesalers, but also work to recruit other wholesalers to also join the program.

Because of our previous implementation of the program, we have already compiled lists of qualified wholesalers/distributors of gas water heaters. Through telephone calls and in-person visits (if necessary), we continue to recruit and qualify wholesalers/distributors for the program. We send a program announcement to the wholesalers/distributors that we are targeting for the program (i.e., those wholesalers/distributors who did not join the program during 2002/2003). We then contact wholesalers/distributors who are prospects for the program to secure a meeting with the decision maker.

At the meeting with a prospective wholesaler/distributor, our recruitment presentation covers the following topics:

- Background of the program and its success in PG&E's service territory;
- Why program is being implemented;
- What the goals of the program are;
- Structure of program;
- Who is involved;
- What the particular trade ally can expect to get from participating in the program; and
- What is expected of trade ally if he participates.

Each wholesaler who signs up for the program is asked to sign a dealer enrollment form. Each wholesaler agreeing to participate signs a participation agreement and provides three months of past invoice data to develop a baseline of sales. Each participating wholesaler is provided with posters and flyers identifying the wholesaler as a participant in the program and indicating that the wholesaler is offering a \$10 discount on qualified water heaters. These posters are designed to be placed in conspicuous areas that will be frequented by plumbers coming to the wholesaler to purchase water heaters (e.g., by the coffee and doughnuts, in will call). ADM's field representatives train the counter sales staff of each

participating wholesaler on the program and on how they are to track sales of high efficiency gas water heaters for verification.

II.A.3 Train and Support Wholesalers/Distributors

It is imperative that each wholesaler/distributor who participates in the program understands the scope of all associated features and benefits that the program and the technologies have to offer. We are therefore careful to make sure that each wholesaler/distributor who participates is thoroughly informed and trained on the program.

We assign our field representative staff to make the initial contacts, to enlist the participation of the trade allies, to perform any required training, and to provide continued support. From working on the program during 2002/2003, our field staff in PG&E's service territory are well prepared in their knowledge of and experience with implementing the program for trade allies. The fact that our field staff are intimately familiar with program issues will ensure the successful training and support of trade allies. This same experience will also be invaluable in ensuring that trade allies actively participate in the program.

The training of any new participating wholesaler begins when our field representative makes the recruitment visit to the wholesaler. Upon a trade ally agreeing to participate, our field representative begins the training process right there, right then. Each field representative carries promotional materials, point-of purchase materials, and training aids with him/her on the dealer enlistment calls. This allows services to be immediately provided to newly recruited dealers and tends to help close the sale, provides immediate visible value, and establishes an immediate positive and cooperative working relationship. This ability to perform initial training also reduces the number of training-related re-calls, thereby reducing program expense (labor and mileage).

For the training, our field representatives attempt to assemble all of the personnel who will be involved in promoting the program (e.g., counter sales staff). We recognize that this is not always appropriate and that trade ally personnel are not always available. In such cases we schedule another, firm date for conducting the training with the trade ally staff.

Our primary tool for training trade ally personnel is the "Program Training Manual." This manual also provides a ready reference for participant wholesalers who desire to resolve an issue about the program. We have already prepared this program training manual and have also developed additional tools to complement the training manual, such as agreements, forms, advertising information gathering tools, etc.

It is critical that the training be conducted by an experienced professional sales person. Wholesaler/distributor sales representatives are all professional salespersons who are likely to take direction only from someone they perceive to be knowledgeable and adept in sales

techniques. Because of our experience with earlier versions of the program, however, our field personnel are well-equipped to work with the sales staff of a participating wholesaler.

Although the sales staff of small- to medium-size dealers often remains intact over many years, there can be substantial turn-over of the sales staff in larger establishments. This necessitates ongoing training for new personnel.

Continued visiting of participating trade allies is used to continually reinforce the message about high efficiency gas water heaters that the program is promoting. To deliver the “biggest bang for the buck” within a short time-frame and with limited funding, our strategy includes prioritizing the trade allies according to the support they warrant.

- We identify those trade allies that have the ability to provide the greatest impact for the program and target these dealers to receive on-going site visit support from our field personnel. For this higher priority segment, substantial visible presence and support is provided, especially in the early stages of this form of implementation, in order to ensure the consistency, quality, and effectiveness of their participation.
- For the other dealers who have lesser market presence, we use phone calls, mailings, and occasional visits to support their efforts.

Our operating guidelines for trade ally maintenance and support are aimed at focusing the trade ally towards properly using the program and promoting energy efficiency as one of the features and benefits of a gas water heater.

- During the first few months of new trade ally's participation, site visits occur more frequently. The visits serve several purposes, including training of sales personnel, placing of point-of-purchase displays, gathering information, coordinating of cooperative advertising placement (if appropriate), developing discount coupon utilization (if appropriate), and team building. By the end of the first few months, our field representative has developed a solid relationship with a trade ally and the sales personnel. The basic framework for the trade ally's participation in the program has been established, and a trade ally understands what is expected of them. They have also experienced the substantial support that they can expect from ADM.
- During the following months, the frequency with which we call on a trade ally is determined by the trade ally's level of participation. Regular routes are established to reduce travel time and mileage expense. During all trade ally visits, our representative handles any customer issues, checks for proper placement of point-of-purchase materials, determines whether or not new products may have been brought in, and if so, whether or not they are qualified for incentives. Representatives also check to see that all display stands are full and that all promotional material is in place. They review sales records (if appropriate) and obtain trade ally feedback.

- Attendant feedback from field personnel and a trade ally's level of enthusiasm will serve as a baseline by which to judge their level of acceptance, organization, effectiveness, and willingness to actively promote the program. Based on these criteria, the ongoing frequency of visits may be adjusted to compensate for the varying levels of "program enthusiasm" exhibited by each trade ally.

The goal of the ongoing maintenance and support effort is to narrow the differences in program delivery at the trade ally level by bringing low-end participants up to the high quality participation level of those trade allies who actively and enthusiastically embrace the program and its benefits. This also acts to provide trade allies with increased support at emphasis periods of the program.

Our budget projections are based on establishing a high level of trade ally participation. Our experience in previously implementing the program demonstrates that the level of participation by trade allies is directly influenced by the level of support they receive early on in the program. We can certainly increase the number of trade allies addressed by reducing the number and length of calls on participating trade allies. However, we emphasize that our proposed program has a solid foundation on which to continue and grow, based on our work during 2002/2003 with water heater wholesalers/distributors in PG&E's service territory.

II.A.4 Verify Purchases and Make Incentive Payments

During the course of the program, an ADM field representative visits each participating wholesaler at least once a month to perform verifications, deliver point-of-purchase materials and T-shirts, answer questions, train new counter sales staff and create a sense of continued and thorough involvement. This repeated visiting helps create confidence in the program as well as discourages fraud.

From the perspective of the wholesalers/distributors who are the main trade allies for the program, the timeliness with which they receive the incentive payments for high-efficiency gas water heaters that they purchase is an important consideration. Accordingly, we make the incentive payments to a trade ally within 15 days of receiving their invoice confirming their purchase from manufacturers or sales to plumbers of qualified high-efficiency gas water heaters.

On signing onto the program, a wholesaler is paid the incentives on the current inventory, with the incentive payment effective the day prices are lowered to the plumber. Incentive payments continue to wholesalers as they submit their current manufacturer invoices, typically by fax. Payments are made within ten days of receiving the invoices or records of sales of high efficiency water heaters to plumbers. Each wholesaler has to provide verification of discounting the water heaters to the plumber.

To verify purchases and to make incentive payments we use a process that has been tailored to accommodate the different needs of different types of wholesalers/distributors. Several options are made available.

- The most common method we use to verify purchases is through computer tracking. It has been our experience that most wholesalers can enter a specific line-item code in the computer every time a qualifying water heater is sold at discount. (As an example, a line-item code might be the existing model number with “REB” appended.) Verification simply consists of pulling a history of that specific code for a specific time period and totaling. This number has to match the quantity of heaters rebated by ADM.
- Some companies will be able to print and mail to ADM copies of every plumber invoice for every rebated water heater sold.
- For other companies, our field representative might view the plumber invoices on his regular visit. Again, these are totaled and compared with the quantity rebated by ADM.
- Companies with large, interstate corporate pricing structures find it difficult to modify their prices regionally. In the verification process that we have developed for these types of companies, we print voucher coupons that they pass out to qualified plumbing contractors upon sales of qualifying water heaters. The plumbing contractor submits the voucher to us for payment. Upon request, the plumber has to provide a customer invoice to ADM stating the high efficiency water heater was installed as a replacement item. Typically, plumbing contractors who specialize in replacements purchase one or two water heaters at a time. Purchases of five or more water heaters are investigated further to ensure that the purchases are not for new construction projects.

II.A.5 Use Program to Promote and Market High Efficiency Gas Water Heaters

We use the Upstream High Efficiency Gas Water Heater Program to promote and market high efficiency gas water heaters. A major element of our intervention strategy pertains to marketing outreach. For the wholesalers and distributors, materials for the sales counters are provided, as well as materials oriented as outreach mechanism to their customers through mailings, invoicing, and quoting. Examples of the marketing and promotional materials that we have prepared are included in Appendix B.

While we direct incentives towards the wholesalers/distributors to get them to lower the prices of high efficiency gas water heaters, our marketing outreach also goes out to plumbing contractors. We found in our previous implementations of the program that informing plumbers about the availability of discounts for high efficiency gas water heaters and alerting them as to which wholesalers/distributors were offering the discounts set up market dynamics favorable to increasing the sales of the high efficiency units. Plumbers responded to the price and availability information by directing their purchases to the wholesalers/distributors participating in the program.

II.A.6 Coordinate with Other Programs

While the greatest potential for changing the market is at the point where a plumber purchases a water heater from a wholesaler/distributor, there are alternative avenues and approaches that we consider for incorporation into our final program design. We therefore coordinate the effort for the Upstream High-Efficiency Gas Water Heater Program with other programs.

For example, outreach activities to manufacturers may also be made. From the management perspective, manufacturers will be contacted to communicate the overall program and higher level strategies. Our goal will be to coordinate any feasible activities, obtain feedback, and access manufacturer strategies. Where possible, we will co-sponsor customer and counter days with manufacturers and see that our marketing materials are distributed from their display booths. In addition, visits that our field representatives make to wholesalers/distributors will be coordinated with manufacturer representatives. This will facilitate a relationship building process and will give our field personnel access to difficult trade allies.

II.B MARKETING PLAN

To recruit wholesalers/distributors into the program, lists of qualified wholesalers / distributors of gas water heaters in PG&E's service territory are compiled using business directories and industry contacts. Wholesalers/distributors on these lists are recruited and qualified for the program through telephone calls and in-person visits (if necessary).

Wholesaler qualification is based first on a wholesaler indicating he/she is willing to stock high efficiency water heaters and second on the wholesaler being willing to follow the program guidelines, particularly those involving the verification process. Also, at the first on-site inspection, we determine whether the wholesaler is capable of providing the proper documentation for the purpose of verification.

Manufacturer coordination is necessary to make sure that an adequate number of qualifying units can be delivered in Northern California, particularly to participating distributors. This "heads-up" information is provided to the manufacturers to enable them to properly plan for manufacturing and distribution. Also, we try to obtain information if the delivery of a high-efficiency water heater would cause any delivery problem.

The process of recruiting and qualifying wholesalers/distributors for the program has the following steps:

- A program announcement is sent to the wholesalers/distributors that are being targeted for the program.

- Once wholesalers/distributors have received the program announcement, they will have time to digest and broadcast the information. Because the wholesale/distribution market for gas water heaters is a relatively tight-knit community, it can be expected that the word will spread.
- Prospective trade allies are contacted to secure a meeting with the decision maker. Contact strategies are employed to maximize the number of successful appointments. Strategies include tried-and-proven techniques for getting the appointment. Program personnel are trained to adhere to all customer service protocols (e.g., to remain courteous and never push).
- Our experience has shown that some trade allies who are initially reluctant to participate because of perceived confidentiality issues become willing participants upon receiving an agreement in writing. Accordingly, we can proffer them the Statement of Confidentiality Agreement that we have prepared for the program.

Wholesaler appointments are scheduled to ensure that the decision-maker is there on site and available to speak with our field representative when he visits. The recruitment presentation covers the following topics:

- Background of the program and its success in PG&E's service territory
- Why program is being implemented
- What the goals of the program are
- Structure of program
- Who is involved
- What the particular wholesaler can expect to get from participating in the program
- What is expected of wholesaler if he participates

II.C CUSTOMER ENROLLMENT

Each wholesaler who signs up for the program is asked to sign a dealer enrollment form. Each wholesaler agreeing to participate signs a participation agreement and provides three months of past invoice data to develop a baseline of sales.

II.D MATERIALS

Gas water heaters with an energy factor of 0.62 or higher are eligible for rebates under the Upstream High Efficiency Gas Water Heater Program.

II.E PAYMENT OF INCENTIVES

During the course of the program, an ADM field representative visits each participating wholesaler routinely to perform verifications, deliver point-of-purchase materials, answer questions, train new counter sales staff and create a sense of continued and thorough involvement. This repeated visiting helps create confidence in the program as well as discourages fraud.

From the perspective of the wholesalers/distributors who are the main trade allies for the program, the timeliness with which they receive the incentive payments for high-efficiency gas water heaters that they purchase is an important consideration. Accordingly, we make the incentive payments to a trade ally within 15 days of receiving their invoice confirming their purchase of qualified high-efficiency gas water heaters.

On signing onto the program, a wholesaler is paid the incentives on the current inventory, with the incentive payment effective the day prices are lowered to the plumber. Incentive payments continue to wholesalers as they submit their current manufacturer invoices, typically by fax. Payments are made within 15 days of receiving the manufacturer invoices. Each wholesaler has to provide verification of discounting the water heaters to the plumber.

To verify purchases and to make incentive payments we use a process that has been tailored to accommodate the different needs of different types of wholesalers/distributors. Several options are made available.

- The most common method we use to verify purchases is through computer tracking. It has been our experience that most wholesalers can enter a specific line-item code in the computer every time a qualifying water heater is sold at discount. (As an example, a line-item code might be the existing model number with “REB” appended.) Verification simply consists of pulling a history of that specific code for a specific time period and totaling. This number has to match the quantity of heaters rebated by ADM.
- Some companies will be able to print and mail to ADM copies of every plumber invoice for every rebated water heater sold.
- For other companies, our field representative might view the plumber invoices on his regular visit. Again, these are totaled and compared with the quantity rebated by ADM.

Smaller wholesalers who do not have a large sales volume prefer a simpler method of verification. In the verification process that we have developed for these types of companies, we print voucher coupons that they pass out to qualified plumbing contractors upon sales of qualifying water heaters. The plumbing contractor submits the voucher to us for payment. Upon request, the plumber has to provide a customer invoice to ADM stating the high efficiency water heater was installed as a replacement item. Typically, plumbing

contractors who specialize in replacements purchase one or two water heaters at a time. Purchases of five or more water heaters are investigated further to ensure that the purchases are not for new construction projects.

II.F STAFF AND SUBCONTRACTOR RESPONSIBILITIES

Our staffing structure and responsibilities for the Upstream High Efficiency Gas Water Heater Program are shown in Table II-1.

Table II-1. Staffing Structure and Responsibilities

<i>Name</i>	<i>Title</i>	<i>Responsibilities</i>	<i>% Avail.</i>
Taghi Alereza	Principal in Charge	Overall technical and administrative	8%
Richard Ely	Project Manager	Daily project management	30%
Donald Dohrmann	Principal	Development of tracking system and M&V coordination	8%
Safdar Chaudhry	Senior Associate	Field staff coordination	15%
Lon Smith	Senior Associate	Recruitment Coordinator	15%
Waqar Mustafa	Associate	Field Staff	15%
Saeid Varasteh	Associate	Tracking Database Support	40%
Doug Thomas	Associate	Field Staff	40%
Richard Burkhart	Assistant	Marketing material development	10%
Holly Farah	Assistant	Tracking System Maintenance	30%

II.G WORK PLAN AND TIMELINE FOR PROGRAM IMPLEMENTATION

Our proposed timeline for implementing the Upstream High Efficiency Gas Water Heater Program in PG&E’s service territory is shown in Table II-2. This timeline is for a program covering PY 2004 and PY 2005.

Table II-2. Timeline for Implementing Upstream High Efficiency Gas Water Heater Program in the Pacific Gas and Electric Co. Service Territory

<i>Activity</i>	<i>Target Date</i>
Program Begins	February 2, 2004
Program Implementation Plan	February 20, 2004
Evaluation, Measurement & Verification Plan	March 15, 2004
First Quarter Report	April 30, 2004
Second Quarter Report	July 31, 2004
Third Quarter Report	October 31, 2004
Fourth Quarter Report	January 31, 2005
Fifth Quarter Report	April 30, 2005
Sixth Quarter Report	July 31, 2005
Seventh Quarter Report	October 31, 2005
Eighth Quarter Report	December 31, 2005
Program Deadline	November 30, 2005
Final Report	December 31, 2005

III. CUSTOMER DESCRIPTION

III.A CUSTOMER DESCRIPTION

Households of course are the ultimate purchasers of gas water heaters. They purchase water heaters primarily for two reasons: to replace old water heaters or to install in new housing. Only water heaters purchased for replacement purposes are eligible for incentives under the proposed Upstream High Efficiency Gas Water Heater Program.

Most purchases of gas water heaters represent a purchase to replace a failed water heater, and focusing the Upstream High Efficiency Gas Water Heater Program on replacement purchases of water heaters therefore targets most of the market for gas water heaters. In their work to support the revision of the NAECA standards for water heaters, Lawrence Berkeley Laboratory estimated that replacement purchases represent from 71% to 85% of nationwide water heater purchases. Data collected by Itron/RER as part of the Statewide Residential Efficiency Market Share Tracking Study indicated annual statewide sales of just over 885,000 gas water heaters, of which about 89 percent were for replacement purposes.

III.B CUSTOMER ELIGIBILITY

We focus the Upstream High Efficiency Gas Water Heater Program on water heater wholesalers/distributors serving customers in the service territory of PG&E.

Only water heaters sold for replacement purposes receive discounts; water heaters sold for new construction do not receive the discounts.

Water heaters eligible for discounts under the proposed program must have energy factors of 0.62 or higher. Although the current standard for gas water heaters requires them to have an energy factor of 0.53 or higher, a new standard will increase the required energy factor to 0.58 in 2004. Thus, there is an opportunity to further promote the higher efficiency water heaters.

III.C CUSTOMER COMPLAINT RESOLUTION

To allow for questions or complaints, we establish a toll-free (“800”) telephone line that can be accessed by wholesalers/distributors of gas water heaters in PG&E’s service territory, by plumbers, and by the public. Wholesalers can use this line to request information about the program or to place a complaint. Plumbers and the public can also use the same 800-number to request information or lodge complaints about lack of cooperation from wholesalers/distributors in terms of availability of water heaters, or incentive payments. We respond to any requests or complaints within 3 days.

Each information or complaint call is documented on a computerized form. This form provides for the recording of caller profile information, date and time of the call, nature of

the call, resolution of the call, and any other relevant information. All complaint forms are maintained in a computerized database that will be accessible by PG&E and CPUC personnel for verification and auditing purposes.

Corrective actions for complaint calls are taken as appropriate and documented on the form. Cases where actions or verification visits are pending are kept in an active status file. Closed cases where problems have been resolved are retained to ensure documentation of problems and their solutions.

Periodic reports that summarize the number of information/complaint calls, the complaint backlog, and the time required for resolving complaints are prepared and included in the quarterly reports to PG&E.

III.D GEOGRAPHIC AREA

We are proposing to implement the Upstream High Efficiency Gas Water Heater Program in PG&E's service territory.

IV. MEASURE AND ACTIVITY DESCRIPTIONS

IV.A ENERGY SAVINGS ASSUMPTIONS

To determine the gas savings that result from the Upstream High Efficiency Gas Water Heater Program, we use a baseline energy factor of 0.58 (per the standards to take effect in 2004). All water heaters rebated under the program will have energy factors of 0.62 or higher. The gas savings expected from the program are based on this difference.

IV.B DEVIATIONS IN STANDARD COST-EFFECTIVENESS VALUES

We have used values for effective useful life and net-to-gross as prescribed in the Energy Efficiency Policy Manual or the CEC's DEER database to determine the cost-effectiveness of the Upstream High Efficiency Gas Water Heater Program. However, we have used a different incremental measure cost, since upstream costs are lower than those indicated in DEER. Our incremental measure cost is based on our actual experience in implementing an upstream program in PG&E's service territory during 2002/20003.

IV.C REBATE AMOUNTS

The amount of incentive that we propose to offer through the Upstream High Efficiency Gas Water Heater Program is based on our market research and our experience in previously implementing the program.

When we initially implemented a similar program for Southern California Gas Company in 1999, we offered wholesalers a \$30 per unit rebate for stocking gas water heaters with energy factors of 0.60 or higher, but with \$20 of the rebate being passed on to plumbing contractors as an instant rebate when they purchased one of the higher efficiency units. During the second year of that program we were able to reduce the rebate to wholesalers to \$22 per unit, again with the understanding that most of the rebate would be passed on to plumbing contractors as an instant rebate. By the third year of the program (i.e., the last half of 2001), the rebate that we offered to wholesalers was reduced to \$10 per unit, with \$7 being passed on to plumbing contractors as an instant rebate. At the same time, the energy factor for a water heater to qualify for the rebates was raised. In practice, the \$7 rebate for water heaters with a qualifying energy factor put their cost to a plumbing contractor at about the same level as a water heater with a lower energy factor.

When we implemented the Upstream High Efficiency Gas Water Heater Program in PG&E's service territory during 2002/2003, we put the rebate level at \$10 per unit, with \$7 being passed along as an over-the-counter discount to the plumber and \$3 remaining with the wholesaler to cover his administrative costs.

For the Upstream High Efficiency Gas Water Heater Program that we are proposing for 2004/2005, we propose to set the rebate that we offer to wholesalers at \$14 per unit, with \$10 to be passed along as an over-the-counter discount to the plumber and \$4 that can

remain with the wholesaler to cover his administrative costs. The reason for setting the rebate at this level is to reflect changes in the market for gas water heaters. In particular, because new regulations on gas water heaters have come into effect, the cost of water heaters has increased by nearly 50%. Consequently, rebates at the previous levels would not have the same incentive effect given the new prices at which water heaters are being sold. Raising the rebate amount will restore the incentive effects.

IV.D ACTIVITIES DESCRIPTIONS

There are no other programs that are expected to produce measurable energy savings.

V. GOALS

The program performance goal for the Upstream High Efficiency Gas Water Heater Program is to provide incentives to encourage the sales of high efficiency gas water heaters (i.e., gas water heaters with energy factors of 0.62 or higher). The target numbers of high efficiency gas water heaters to be incented is shown by program year in Table V-1.

*Table V-1. Target Numbers of Water Heaters to be Incented
in PG&E Service Territory*

<i>Program Year</i>	<i>Number of Units</i>	<i>Gas Savings (Therms)</i>
PY 2004	12,800	168,650
PY 2005	19,200	252,980
Total	32,000	421,630

VI. PROGRAM EVALUATION, MEASUREMENT AND VERIFICATION

VI.A APPROACH TO PROGRAM EM&V

This section discusses our approach to performing the evaluation, measurement and verification work for the Upstream High Efficiency Gas Water Heater Program and to reporting on program progress.

ADM will contract with an independent third party who is not affiliated with ADM to evaluate the Upstream High Efficiency Gas Water Heater Program and to measure and verify its claimed energy savings and measure installations. To assist the independent contractor in performing the M&V work, we collect needed data during the implementation of the program.

We use our program tracking system to identify the wholesalers/distributors who participate in the program and to track the number of water heaters incented for these dealers. We also use the tracking system to collect information about the characteristics of the water heaters being incented (e.g., model number, size, energy factor) that can be used to calculate and assess the energy savings that can be attributed to the program.

To verify the data that we will have gathered from wholesalers/distributors regarding the types of water heaters they are stocking and selling to plumbing contractors, we conduct a telephone survey of a sample of plumbing contractors to obtain additional quantitative information regarding the numbers and types of water heaters they have been installing. We also use the telephone survey to identify factors that are important in affecting the decisions of plumbing contractors to encourage their customers to purchase high-efficiency gas water heaters when they need to replace an old water heater.

To avoid double counting of savings for gas water heaters that are incented under this program and that also may be incented under PG&E's single family rebate program, we coordinate with PG&E to obtain information on the number of high efficiency gas water heaters that have been incented under their program. This number is subtracted from the number of water heaters receiving rebates through this Upstream High Efficiency Gas Water Heater Program. The resulting net number of gas water heaters is the number that is used to calculate savings attributable to the Upstream High Efficiency Gas Water Heater Program.

From our work in implementing and evaluating energy efficiency programs, we know the importance of having good information in a program tracking system in order to track the progress of the program and to evaluate its effects. For the Upstream High Efficiency Gas Water Heater Program, we already have in place the system for tracking the work, based on the work for SoCalGas that we have conducted over the past several years. This tracking system is a full system that includes procedures, policies, protocols, forms, data entry and the data storage methods. The system is up and running and will require little modification

to tailor it to meet the data collection and reporting requirements involved in our implementing of the Upstream High Efficiency Gas Water Heater Program.

We use the system to track specific types of information that enable us to evaluate the progress of the program and our efforts. The information that we track includes the following:

- Total number of participating wholesalers/distributors and other trade allies
- Brands of gas water heaters that they carry
- Sizes of gas water heaters that they carry
- Styles of gas water heaters that they carry (qualifying vs. non-qualifying)
- Total sales of qualifying products (size, brand, style, etc.)
- Total incentive payments by type
- All available information on impacts of the program, including anecdotal feedback from market actors.

We employ a file aging approach to track the length of time for processing incentive payments to participating wholesalers/distributors and to be able to accurately inform them about the status of their incentive requests. File aging will include the following dates:

- Date the information was entered into the database
- Date that a letter was sent for additional information (if necessary)
- Date that it was approved for payment
- Date that the check was sent

During the course of the program, we use the tracking system to prepare quarterly reports that detail the activities and progress towards meeting the goals of the program. Each quarterly report includes information on the number of water heaters incented and their characteristics (e.g., size, energy factor, etc.).

At the end of the program, we provide the data in the tracking system to the independent EM&V contractor to use in preparing the evaluation of the program's effects. This evaluation will include information about all activities undertaken as part of the program, including the number of water heaters that were incented.

VI.B POTENTIAL EM&V CONTRACTORS

Potential EM&V contractors for the Upstream High Efficiency Gas Water Heater Program include the following firms:

- Robert Mowris and Associates

- Sisson and Associates
- Ridge and Associates
- Itron (RER)

Each of these firms was an EM&V contractor for programs funded by the CPUC for 2002/2003 and have the capabilities and experience required to perform the evaluation of the Upstream High Efficiency Gas Water Heater Program.

VII. DESCRIPTION OF ADM'S QUALIFICATIONS

This section provides information on the qualifications of ADM Associates and of the personnel who will be the staff for the Upstream High Efficiency Gas Water Heater Program.

VII.A QUALIFICATIONS OF ADM ASSOCIATES (PRIME IMPLEMENTOR)

ADM's ability to implement the Upstream High Efficiency Gas Water Heater Program is based on our considerable experience in working with small business firms to improve energy efficiency. In particular, the Upstream High Efficiency Gas Water Heater Program that we are here proposing extends programs that ADM has previously implemented.

- For Southern California Gas Company, we implemented an upstream high efficiency gas water heater program between 1999 and 2001. In our program for SoCalGas, we promoted high-efficiency gas water heaters by providing incentives to wholesalers/dealers to stock and sell such units, who in turn discounted the price of the units when selling them to plumbing contractors. Only water heaters sold for replacement purposes received the discounts; water heaters sold for new construction did not receive the discounts. Through this program we promoted the sales of more than 77,000 high-efficiency gas water heaters for installation in residential houses. (By contrast, fewer than 100 high efficiency gas water heaters were installed through the Residential Contractor Program, the other major program through which sales of high efficiency water heaters were being promoted.)
- During 2002/2003, we received public goods funding from the CPUC to implement an upstream high efficiency gas water heater program in the service territory of PG&E. This program was patterned on our earlier program for SoCalGas.

Following are brief descriptions of other projects where we have provided energy efficiency services.

- **Upstream High-Efficiency Gas Water Heater Program**

For: Southern California Gas Company

Under a contract with Southern California Gas, ADM implemented an upstream gas water heater program to increase the market penetration of high efficiency gas water heaters. For this program, we worked with wholesalers and distributors of gas water heaters as well as with plumbers to increase the sales of the higher efficiency gas water heaters. We provided rebates to wholesalers and distributors for each high efficiency gas water heater that they stocked and sold, but with two-thirds of the rebate going to reduce the price at which the water heaters were sold to plumbers and with one-thirds going to the wholesaler/distributor to defray his administrative costs. All of the major wholesalers/distributors in SoCalGas's service area participated in the program, which increased the sales of high efficiency gas water heaters significantly.

- **Mobile Energy Clinic Program**

For: Southern California Gas Company and Southern California Edison Co.

Under contracts with Southern California Gas and Southern California Edison, ADM designed and implemented the Mobile Energy Clinic energy efficiency program. In this program, we focus on improving energy efficiency for small businesses by making no-cost/low-cost improvements for energy efficiency and by providing diagnostics of energy-using equipment for small businesses. Small businesses that participate in this program have actual no-cost/low-cost improvements made to their equipment. They also have their HVAC performance tested, condenser coils cleaned, filters changed, lighting systems evaluated, and other energy using equipment such as water heaters, compressors and process equipment checked for proper use. Owners/managers are given a checklist of other energy efficiency actions that they can take.

- **Beverage Vending Machine Program**

For: Southern California Edison Company

Under contract with SCE, we implemented an Energy Savings Program for Beverage Vending Machines. We installed VendingMisers™ or time clocks (as appropriate) on 3,400 vending machines in SCE's service territory. The control strategies are defined by (1) whether the vending machine is lighted and (2) whether the location of the machine will permit use of a time clock or requires use of a VendingMiser™. Most of these savings will go to small commercial customers, who are a particular target for the program.

- **Lodging Industry Energy Education Program**

For: Southern California Gas Company

Through the Lodging Industry Energy Education Program, ADM visited hotels/motels in SoCalGas's service territory and offered their operators hands-on assistance to identify ways in which they can improve energy efficiency and save energy in their facilities. The Lodging Industry Energy Education Program demonstrated that a hands-on approach is a very effective approach to getting small business owners to think about energy and to take actions to improve energy efficiency. We visited over 900 lodging facilities during 2000 and have visited over 400 more in 2001.

- **Duct Efficiency Programs**

For: Pacific Gas and Electric

Southern California Edison

Southern California Gas

San Diego Gas and Electric

Under the California Board for Energy Efficiency's third party program, ADM was under contract with the four major investor-owned utilities in California (i.e., Pacific

Gas and Electric, Southern California Edison, San Diego Gas and Electric, and Southern California Gas) to implement residential duct efficiency programs throughout California. The Duct Efficiency Programs were aimed at institutionalizing good duct design and establishing retrofit duct repair as a component of HVAC maintenance. Through the Duct Efficiency Program, we provided HVAC and/or sheet metal contractors with the information, procedures, and technologies that they could use to market duct leakage inspection and repair services to residential single-family and multi-family houses. Through the program, contractors were educated and trained on how to provide duct inspection and repair services as a viable business venture. Contractors were taught new techniques and procedures that were explicitly designed under this program in order to be effective and not too expensive. Contractors who participated in the programs were also assisted in identifying households who are interested in having their duct system inspected and repaired.

- **RCP Training**

For: Southern California Gas
Southern California Edison

ADM conducted training workshops to provide training to HVAC contractors to better equip them to participate in the Residential Contractors' Program. One aspect of the training was to provide training in central air conditioner/central heat pump diagnostic tune-up, duct testing and duct sealing in conjunction with SCE/SoCalGas Installation Standards. The other aspect was to provide an overview of the RCP fulfillment process from consideration of installation of energy efficiency measures through completion of work and contractor payment. This overview included proper completion of program-related paperwork, including Incentive Voucher/Application and Customer Information and Declaration forms.

- **Local Energy Assistance Program**

For: Southern California Edison
Pacific Gas and Electric
Southern California Gas

ADM developed a program that we implemented throughout California to provide assistance to the planning departments in selected communities to encourage energy efficiency in new industrial and commercial developments that are being proposed in those communities. This program included directly influencing specific development plans and providing assistance to the planning departments of the local governments to plan/approve planing and zoning areas, based on energy use as well as other infrastructure criteria presently used. We also disseminated information regarding the results of these energy planning activities to other communities. Our program in California was funded at \$1.2 million by the major utilities (i.e., Pacific Gas and Electric, Southern California Edison, and Southern California Gas).

- **Energy Efficiency Site Surveys of Commercial, Industrial, and Agricultural Facilities**

For: Pacific Gas and Electric

In this project for PG&E, we are conducting surveys of commercial, industrial, and agricultural customer facilities to identify and analyze the energy efficiency opportunities using the 1-2-3 tiered approach to energy conservation. For Tier 1, we identify and analyze the no-cost energy efficiency opportunities in each customer facility. For Tier 2, we identify and analyze the low-cost energy efficiency opportunities in each customer facility. For Tier 3, we identify and analyze customer facilities with a view to identifying energy efficiency opportunities that will require major financial investments on the part of the customers. All recommendations target and prioritize measures and technologies that deliver both immediate and long-term peak-period kW demand savings and annual kWh and therm savings.

- **Energy and Water Efficiency Services Support**

For: Colorado Springs Utilities

Under this contract with the City of Colorado Springs Utilities, ADM provided energy and water efficiency services for CSU's industrial and large commercial customers. We provided feasibility evaluations for energy and water efficiency projects and provided design plans for energy and water efficient projects. In addition, we provided training on energy and water efficiency projects for CSU staff.

- **Technical Support to Demand Side Management Unit**

For: Jamaica Public Service Company, Ltd.

Under a contract with the Jamaica Public Service Company, ADM provided technical support to JPSCo's Demand Side Management Unit. We provided a Resident Consultant who worked with JPSCo staff in planning demand-side management programs for JPSCo's customers. Subject areas for which we provide technical support included program planning and implementation, cogeneration feasibility studies, energy auditing, building codes, simulation modeling, monitoring, and program evaluation.

- **Technical Audits for Large Industrial Customers**

For: Power Agency of California

Under contract with the Power Agency of California, we conducted audits of large industrial electricity customers in order to identify appropriate energy efficiency improvements. To support this activity, we developed the audit form to be used in data collection, conducted on-site interviews of plant personnel on facility operations, collected other relevant data on-site, evaluated the collected data, and prepared engineering estimates of the energy savings for energy efficiency improvements for each of the audited facilities. Estimates of expected savings were developed through

engineering calculations or through simulations with computerized energy analysis models.

- **Business Energy Advocates Program for Small Business**

For: California Energy Extension Service

ADM provided marketing and technical support services on energy conservation for a program to encourage small business firms in California to adopt techniques and technologies that reduce energy consumption and costs. The program was also intended to reduce the barriers encountered by business firms in gaining access to energy management techniques and practices. We identified energy conservation measures that are particularly applicable to given types of businesses and supported their applications for utility company incentive payments and low-interest small business loans.

- **Commercial Audits Project**

For: Entergy Services, Inc.

For Entergy, we performed the Commercial Audits Project. We performed on-site audits at about 650 commercial facilities throughout Entergy's service area. Using the data collected through these audits, we prepared customer-specific DOE-2 analyses of energy savings from conservation measures. We prepared audit reports for the individual customers and also aggregated the data to prepare system-level estimates of the saturations of various end-use technologies and DSM measures.

- **Energy Audit Services for Small and Medium Commercial and Industrial Customers**

For: El Paso Electric

For El Paso Electric, ADM provided energy audit services to its small- and medium-size commercial and industrial customers. We conducted energy audits for approximately 250 small C&I customers and for approximately 75 medium C&I customers. The audit services included collecting data on-site, preparing an analysis of energy use and potential energy efficiency measures (using our *CPA 123* model), and preparing an audit report for each customer audited.

VII.B DESCRIPTION OF EXPERIENCE FOR KEY PERSONNEL

Our staffing structure for the Upstream High Efficiency Gas Water Heater Program was presented in Section II.F. Descriptions of the experience of the key personnel for the program are provided in this section.

Taghi Alereza, P.E., who is President of ADM, will be the Principal-in-Charge of the work. Mr. Alereza is a nationally recognized expert in building energy simulation and modeling. He has pioneered the development of several state-of-the-art simulation

procedures and models. Mr. Alereza has led ADM's effort to develop and implement two statewide residential programs during the 1998 program year. He conceived and developed the "Residential Duct Efficiency Program," which was implemented in the service territories of Pacific Gas and Electric, Southern California Edison, Southern California Gas and San Diego Gas and Electric. Mr. Alereza also conceived the Local Energy Assistance Program (LEAP), which was implemented in the PG&E, SCE and SCG service areas. This program provided extensive training to developer/builders, local government staff and elected officials. He has directed program design and implementation including

- "Upstream High Efficiency Residential Water Heater Program" - implemented for Southern California Gas Co.
- "Refrigerated Vending Machine Cycling Program" - designed and implemented for Southern California Edison Co.
- "Performance Assurance Project" - designed and implemented simplified building commissioning project for Southern California Edison Co. and San Diego Gas and Electric Co.
- "Mobile Energy Clinic" – designed and implemented for Southern California Gas Co.
- "Lodging Industry Education And Audit Program" – designed and implemented for Southern California Gas Co.

Mr. Alereza holds a Bachelor of Mechanical Engineering degree from Auburn University and has completed an MS and the coursework for D.Sc. in mechanical engineering from the George Washington University. He is a member and past chairman of ASHRAE Technical Committee 9.6 (Energy Utilization), which is responsible for developing and applying protocols for assessing energy use in buildings, and the cognizant TC for the ASHRAE Standard 90.2. He is a registered professional engineer in California.

Richard Ely, Ph.D., is a Senior Economist and Research Specialist with ADM Associates, Inc. Dr. Ely will serve as the day-to-day project manager. Dr. Ely's responsibilities include directing ADM's activities in the areas of developing, new energy efficiency programs, and design and implementation of market research projects. Additionally, his responsibilities include innovative project management, energy market modeling, and forecasting. He has implemented several telephone, mail, and in-person surveys for several major utilities. He was a project director for an Upstream High Efficiency Water Heater program conducted for Southern California Gas Co. In this project, ADM promoted and provided incentives for over 77,000 high efficiency water heaters. Dr. Ely was responsible for coordination of the availability of water heaters with manufacturers and distributors. He also conducted focus groups with manufacturers, distributors and plumbing contractors to identify ways to increase the sales of high efficiency water heaters. He has developed innovative energy efficiency programs for numerous utilities. He initiated the third party process for non-utility DSM projects in California, and he, participated on numerous energy efficiency and

direct access working groups and committees. He has helped create and manage projects that bring together end-users, regulators, retailers and other market actors throughout the US. Dr. Ely received his BS from MIT, his MS in Engineering from the University of California at Berkeley, a MS in Resource Economics from the University of Rhode Island, and a MA in Economics and a Ph.D. in Resource Economics from the University of Connecticut

Dr. Donald Dohrmann is a Principal of ADM Associates and Director of Economic Studies. He will be responsible for market analysis and measurement, evaluation, and verification for the program. Dr. Dohrmann has technical expertise in economics, survey design, and statistical analysis. He has developed and applied analytical methodologies for evaluating DSM programs, including evaluations of Portland General Electric's commercial new construction programs, Northern States Power's high efficiency motors and adjustable speed drives programs, Pacific Gas and Electric's Commercial New Construction Program and its Nonresidential Energy Management Services Programs. He has been responsible for designing the statistical sampling plans for surveys of residential, commercial and industrial firms that ADM has conducted for various companies, including Pacific Gas and Electric Company, Southern California Edison Company, the Bonneville Power Administration, Florida Power and Light, B.C. Hydro, Kansas City Power and Light, El Paso Electric, Southern California Edison Co., the Sacramento Municipal Utility District, San Diego Gas and Electric Co., and many other utilities. Dr. Dohrmann received his B. S. in economics from Iowa State University and his M. A. and Ph. D. in economics from Yale University.

Dr. Safdar Chaudhry is a Senior Engineer at ADM Associates, Inc. Dr. Chaudhry has been directing, and performing day-to-day management, of the Mobile Energy Clinic program being implemented in the SCE and SCG service areas. While at ADM, Dr. Chaudhry has performed engineering analysis and evaluations for several residential, commercial and industrial facilities conducted for several utilities including PGE, SMUD, SCE and B.C. Hydro. He conducted on-site inspections, analysis, energy conservation recommendations and report preparation in most of these projects, and has been responsible for organizing and managing several other energy efficiency improvement projects. He developed energy conservation evaluation procedures, monitored field staff, and reviewed recommended energy measures for the Mobile Energy Clinic program conducted for Southern California Gas Company. He also developed energy auditing and measure evaluation procedures conducted for the Lodging Industry Education Program conducted for SCG. Dr. Chaudhry has been responsible for hundreds of building energy simulations using DOE-2, CALRES and other computer simulation programs. Dr. Chaudhry has a Ph.D. in Mechanical Engineering from the University of Birmingham, a M.S. in Mechanical Engineering from George Washington University and a B.S. in Mechanical Engineering from the University of Engineering and Technology in Pakistan.

Lon Smith is a Senior Associate at ADM Associates, Inc., responsible for development and conducting training in the areas of HVAC systems. He has extensive experience in refrigeration, transport and control systems in residential, commercial and industrial buildings. During his previous employment of 20 years with United Refrigeration Inc., Honeywell Inc., and New England Sheet Metal Works, Inc., he has developed an exceptional understanding of not only the theoretical aspects of HVAC and refrigeration systems, but also he has mastered the practical side of these systems as well. In the past, he has provided consultation to HVAC designers, and has conducted training in refrigeration and control systems. Mr. Smith was an instructor at the State Center College District. He taught classes in pneumatic, electrical and electronic controls for commercial, residential and industrial mechanical systems. He has also taught classes on refrigerant types and their application, refrigerant recovery and power distribution systems, and their application to power line carrier transmissions. Some of the projects that Mr. Smith has been responsible for include:

- For the Mobile Energy Clinic Program that ADM performed for Southern California Gas Company, he prepared field procedures and trained field staff.
- For the Upstream High Efficiency Water Heater Program that ADM performed for Southern California Gas Company, he was responsible for coordination of wholesalers, verification and payment.

Mr. Smith is a licensed Energy Auditor for the Environmental Protection Agency and the California Energy Commission. He earned his Bachelor of Arts in Communications from California State University Fresno.

Waqar Mustafa is a Mechanical Engineer at ADM Associates, Inc. His responsibilities include site surveys, building energy end-use analysis, technical evaluation of energy conservation retrofits in commercial and industrial applications, and preparation of energy audit reports. Before joining ADM Associates, Mr. Mustafa was a graduate research assistant in the Industrial Assessment Center, Department of Mechanical Engineering, University of Texas at Arlington. He conducted on-site surveys of several small & medium size manufacturing facilities in Dallas and Fort Worth metroplex, performed analysis of energy efficiency measures, and prepared energy audit reports. These projects were funded by the Department of Energy, Office of Industrial Technology. Mr. Mustafa has earned a B.Sc. in Mechanical Engineering from the University of Engineering and Technology in Lahore, Pakistan. He earned a Master of Science degree in Mechanical Engineering from the University of Texas, Arlington.

Saeid Varasteh is a Database Administrator and Monitoring Specialist at ADM Associates, Inc. As Database Administrator, Mr. Varasteh is responsible for development of tracking databases for ADM implementation projects. He has been responsible for the development of tracking systems for the High-Efficiency Gas Water Heater program that

ADM has been performing for the past three years. As a Monitoring Specialist is responsible for the implementation of end-use monitoring projects, including installing and removing monitoring and data-logging equipment, and verifying, retrieving and validating data. Mr. Varasteh performed surveys and monitoring of 40 residential and 30 commercial sites for seven utility rebate programs. His responsibilities for this project included installing lighting and HVAC monitoring equipment, documenting equipment installation and retrieving monitoring data. Mr. Varasteh holds an M.C.S.E. certification.

Doug Thomas is a field representative at ADM Associates, Inc. He currently performs wholesaler training and program verification for the High Efficiency Gas Water Heater Program that ADM is performing for the California Public Utilities Commission. Mr. Thomas' responsibilities include conducting on-site training sessions for wholesalers, performing verification of sales, and coordination of rebate payments. He also maintains databases of water heaters qualified for program rebate.

Richard Burkhardt serves as the Senior Technical Editor and desktop publisher at ADM Associates, Inc. As technical editor, his responsibilities include copy-editing, graphic design and production for documentation, marketing materials, survey questionnaires, and web page layout and design for ADM projects. He is responsible for the production of a quarterly newsletter and accompanying website for the Southern California Gas Co. *Lodging Industry Education Program*. He was in charge of designing and publishing marketing materials for the Duct Efficiency Training Program, Upstream High-Efficiency Gas Water Heater program and several other energy efficiency marketing programs performed for California utilities. He was responsible for the production of a series of Commercial / Industrial site audit reports for Entergy Services, Inc. For Kansas City Power and Light Co. he developed automated templates using the data linking functions in Microsoft Word and Excel to generate site reports, and was responsible for final copyediting and cleanup of the reports. He has also performed similar work for projects for Southern California Edison Co. He is well versed in the advanced techniques for a wide variety of production software packages and web page design software, under multiple operating systems. Prior to joining ADM, he worked as a freelance editing assistant, performing editing, graphic production and page layout for a series of operating manuals for computerized production equipment. Mr. Burkhardt earned his B.A. degree in Communications from California State University, Fullerton.

Holly Farah is a research architect with ADM Associates, Inc. She is presently involved in a research project that ADM is conducting for the California Energy Commission in the area of energy efficiency in low-income and manufactured housing. She is involved in the development of practical methods for implementation of ducts in conditioned space, in order to minimize duct losses. She has been involved in quality control and rebate processing for the High Efficiency Gas Water Heater program that ADM is conducting in the PG&E service territory. In previous projects, she has used DOE-2 to simulate energy

use in residential buildings, and has assisted in green community development. Ms. Farah holds a master's degree in architecture from Azad University in Tehran.

VIII. BUDGET

Our summary budget table for implementing the Upstream High Efficiency Gas Water Heater Program in PG&E's service territory is detailed in Table VIII-1.

Table VIII-1. Budget Summary for Upstream High Efficiency Gas Water Heater Program in PG&E Service Territory

<i>Budget Item</i>	<i>Amount</i>
Administrative Budget	\$208,415
Marketing Budget	\$15,585
Direct Implementation Budget	\$448,000
EM&V Budget	\$28,000
Other Budget	\$49,000
Budget Total	\$749,000