STATE OF CALIFORNIA
ARNOLD SCHWARZENEGGER, *Governor*

PUBLIC UTILITIES COMMISSION

505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298

Tel. No. (415) 703-1691

March 15, 2006

Advice Letter 2695-G/2771-E

Rose de la Torre
Pacific Gas & Electric
77 Beale Street, Room 1088
Mail Code B10C
San Francisco, CA 94105

Subject: Implementation of tankless water heater pilot project

Dear Ms de la Torre:

Advice Letter Advice Letter 2695-G/2771-E is withdrawn by your letter dated March 6, 2006. A copy of the advice letter is returned herewith for your records.

Sincerely,

Sean H. Gallagher, Director
Energy Division



jjr

Pacific Gas and Electric Company

**Brian K. Cherry**
Director
Regulatory Relations

77 Beale Street, Room 1087
San Francisco, CA 94105

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Mail Code B10C
Pacific Gas and Electric Company
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January 30, 2006

**Advice 2695-G/2771-E**
(Pacific Gas and Electric Company ID U 39 M)

Public Utilities Commission of the State of California

**Subject:** Implementation of Tankless Water Heater Pilot Project

Pacific Gas and Electric Company (PG&E) hereby requests permission to conduct a pilot project with the California State Department of Community Services and Development (CSD) and the Community Action Agency of San Mateo County, Inc. (CAASMC), a community based organization (CBO) performing weatherization for low income clients, to assess Tankless Water Heaters as a prospective low income program measure. The proposed Tankless Water Heater pilot project would be included as part of PG&E's Program Year (PY) 2006 Low Income Energy Efficiency (LIEE) Program. The scope of work and budget for the proposed pilot project is attached in Attachment 1.

## Purpose

The purpose of this filing is to implement a joint Tankless Water Heater pilot project with CSD and CAASMC as part of PG&E's PY2006 LIEE program.

## Background

During December 2005 CSD and CAASMC approached PG&E with a request to partner with them to help fund a pilot project to assess Tankless Water Heaters as a potential new measure of interest to low income customers in the State's LIHEAP program. On December 16, 2005, the Commission issued Decision (D.) 05-12-026 which adopted the utilities PY2006 LIEE programs and budgets. Since the contemplated Tankless Water Heater measure may also be of interest as an energy conservation measure for the utilities' LIEE programs, PG&E was interested to include the pilot project as part if its PY2006 LIEE program. The attached scope of work describes the pilot project and budget commitment. PG&E requests authorization to proceed to work with CSD and CAASMC on this pilot

project. PG&E currently has sufficient LIEE funding available to proceed with this pilot project, and will include the pilot project in its request for a PY2006 LIEE program budget augmentation, due on April 14, 2006, in compliance with D.05-12-026, Ordering Paragraph 12.

**Summary of Tankless Water Heater Pilot**

Tankless water heaters (also known as instantaneous or demand water heaters) are being considered because of their potential for saving energy via three means: 1) the elimination of storage tank heat loss, 2) the ability to only heat water as needed, and 3) the elimination of a pilot light system. Current product literature indicates that savings estimates of up to 20% may be expected from the use of pilotless, tankless water heaters, which could result in a significant savings amount for a low-income household.

The proposed pilot project would allow: 1) the thorough assessment of twenty homes; 2) five tankless water heater units to be installed and monitored in weatherization qualified single family homes during 2006; and 3) a side-by-side usage study in a controlled laboratory environment.

The purpose of this project is to determine whether tankless water heaters are a viable energy conservation measure for addition to the LIEE and CSD packages of energy efficiency measures being offered to qualifying low-income households. The project will address: 1) home assessment and domestic water distribution system selection barriers; and 2) installation barriers and potential pitfalls. Even though the major emphasis will be assessment, selection and installation barriers, actual energy and water usage data will be collected and utilized in assessing associated energy and water savings. The primary focus of the pilot project is not cost effectiveness (savings derived from the use of tankless water heaters) because the California Energy Commission (CEC) and Lawrence Berkeley National Laboratory (LBNL) are also addressing the energy savings issue; however, the void in their effort is those barriers unique to low-income customers, such as system type and location, structural problems, and delayed maintenance, all of which will be investigated in this project. Information derived from this project will be shared with, and gathered from, other tankless water heater researchers.

The pilot program is designed to run over a 15 month timeline, and target CAASMC weatherization qualified participants living in single-family homes (installing tankless heaters in five single family homes). The total program budget is less than $62,000 (see Attachment 1 for program cost breakout). Costs for this program can be incorporated into existing LIEE funding. This pilot would be included in PG&E's in its request for a PY2006 LIEE program budget augmentation, due on April 14, 2006.

**Protests**

Anyone wishing to protest this filing may do so by sending a letter by **February 20, 2006**, which is 21 days from the date of this filing. The protest must state the grounds upon which it is based, including such items as financial and service impact, and should be submitted expeditiously. Protests should be mailed to:

CPUC Energy Division
Attention: Tariff Unit, 4th Floor
505 Van Ness Avenue
San Francisco, California 94102

Facsimile: (415) 703-2200
E-mail: jjr@cpuc.ca.gov and jnj@cpuc.ca.gov

Copies of protests also should be mailed to the attention of the Director, Energy Division, Room 4004, at the address shown above.

The protest also should be sent via U.S. mail (and by facsimile and electronically, if possible) to PG&E at the address shown below on the same date it is mailed or delivered to the Commission:

Pacific Gas and Electric Company
Attention: Brian Cherry
Director, Regulatory Relations
77 Beale Street, Mail Code B10C
P.O. Box 770000
San Francisco, California 94177

Facsimile: (415) 973-7226
E-mail: PGETariffs@pge.com

## Effective Date

PG&E requests that this advice filing be approved by **March 1, 2006**, which is 30 days after the date of filing.

**Notice**

In accordance with General Order 96-A, Section III, Paragraph G, a copy of this advice letter is being sent electronically and via U.S. mail to parties shown on the attached list and the parties on the service list for R.04-01-006. Address changes should be directed to Rose de la Torre at (415) 973-4716. Advice letter filings can also be accessed electronically at: **http://www.pge.com/tariffs**

Director, Regulatory Relations

Attachments

cc: Assigned Commissioner Dian Grueneich
Service List: R.04-01-006

# CALIFORNIA PUBLIC UTILITIES COMMISSION

ADVICE LETTER FILING SUMMARY
ENERGY UTILITY

MUST BE COMPLETED BY UTILITY (Attach additional pages as needed)

Company name/CPUC Utility No. **Pacific Gas and Electric Company (ID U39)**

| Utility type: | Contact Person: Bernard Lam |
|---|---|
| ☑ ELC ☑ GAS | Phone #: (415) 973-4878 |
| ☐ PLC ☐ HEAT ☐ WATER | E-mail: bxlc@pge.com |

EXPLANATION OF UTILITY TYPE

ELC = Electric GAS = Gas
PLC = Pipeline HEAT = Heat WATER = Water

(Date Filed/ Received Stamp by CPUC)

Advice Letter (AL) #: **2695-G/2771-E**

Subject of AL: Implementation of Tankless Water Heater Pilot Project

Keywords (choose from CPUC listing): Energy Efficiency

AL filing type: ☐ Monthly ☐ Quarterly ☐ Annual ☑ One-Time ☐ Other _____

If AL filed in compliance with a Commission order, indicate relevant Decision/Resolution #:

N/A

Does AL replace a withdrawn or rejected AL? If so, identify the prior AL: N/A

Summarize differences between the AL and the prior withdrawn or rejected AL[1]: _____

_____

Resolution Required? ☐ Yes ☑ No

Requested effective date: **3/1/2006** No. of tariff sheets: 0

Estimated system annual revenue effect: (%): TBD

Estimated system average rate effect (%): TBD

When rates are affected by AL, include attachment in AL showing average rate effects on customer classes (residential, small commercial, large C/I, agricultural, lighting).

Tariff schedules affected: N/A

Service affected and changes proposed[1]: N/A

Pending advice letters that revise the same tariff sheets: N/A

**Protests and all other correspondence regarding this AL are due no later than 20 days after the date of this filing, unless otherwise authorized by the Commission, and shall be sent to:**

**CPUC, Energy Division**
**Attention: Tariff Unit**
**505 Van Ness Ave.,**
**San Francisco, CA 94102**
**jjr@cpuc.ca.gov and jnj@cpuc.ca.gov**

**Pacific Gas and Electric Company**
**Attn: Brian K. Cherry**
**Director, Regulatory Relations**
**77 Beale Street, Mail Code B10C**
**P.O. Box 770000**
**San Francisco, CA 94177**
**E-mail: PGETariffs@pge.com**

[1] Discuss in AL if more space is needed.

# ATTACHMENT 1 – ADVICE 2695-G / 2771-E

## A PUBLIC – PRIVATE PARTNERSHIP DESIGNED TO EVALUATE THE FEASIBILITY OF TANKLESS WATER HEATERS FOR LOW-INCOME CUSTOMERS

## 1. SCOPE OF PROJECT

### 1.1 Description

The California State Department of Community Services and Development (CSD) and the Community Action Agency of San Mateo County, Inc. (CAASMC), a community based organization (CBO) performing weatherization for low-income clients, request the participation of PG&E in a public-private partnership to evaluate the applicability of tankless water heaters for use in the LIEE and CSD low-income weatherization programs via a pilot project. Tankless water heaters (a.k.a. instantaneous or demand water heaters) are being considered because of their potential for saving energy via three means: 1) the elimination of storage tank heat loss, 2) the ability to only heat water as needed, and 3) the elimination of a pilot light system. Current product literature indicates that savings estimates of up to 20% may be expected from the use of pilotless, tankless water heaters, which could result in be a significant savings amount for a low-income household.

The proposed pilot project would allow: 1) the thorough assessment of twenty homes; 2) five tankless water heater units to be installed and monitored in

weatherization qualified single family homes during 2006; and 3) a side-by-side usage study in a controlled laboratory environment.

### 1.2 Background

Tankless water heaters heat water directly without the use of a storage tank; therefore, they avoid the standby heat losses associated with storage water heaters. When a hot water tap is turned on, cold water travels through a pipe into the unit and activates the gas burner or an electric element heats which then heats the water. As a result, tankless water heaters deliver a constant supply of hot water. They also attach to a wall and are not free-standing; therefore they are less prone to movement in case of an earthquake.

Typically, tankless water heaters provide hot water at a rate of 2 – 5 gallons per minute, while gas-fired heaters produce higher flow rates than electric models. Although the gas-fired tankless water heaters tend to have higher flow rates than the electric models, they can waste energy if they have a constantly burning pilot light. For this pilot project, models will be installed that have an intermittent ignition device (IID) instead of a standing pilot light.

For homes that use 41 gallons or less of hot water daily, tankless water heaters can be 20% – 30% more energy efficient than conventional storage tank water heaters. They can be 8% – 14% more energy efficient for homes that use a lot of hot water - around 86 gallons per day. An even greater energy savings of 27% – 50% can be achieved if tankless water heaters are installed at each hot water outlet.

Energy efficiency values for gas storage water heaters range from 60 to 65%, and use an average of 200 therms per year. Electric storage water heaters 93 to 95% efficient and use an estimated 4,725 kWh/year. Tankless gas water heaters range from 68 – 82% efficient, about 20% more efficient than storage gas water heaters saving 40 therms or more a year.

Theoretically, a 20% savings in natural gas used to heat water in a typical household (250 therms/year) would result in an annual savings of 50 therms or approximately $50.00 per year. If natural gas prices increase as expected this winter, that savings could amount to $75.00 - $90.00 or more a year.

This savings would become even more significant when considering the life of the measure. Tankless water heaters are estimated to last 10 – 20 years or more with the current level of technology.

### 1.3 Purpose

The purpose of this project is to determine whether tankless water heaters are a viable energy conservation measure for addition to the LIEE and CSD packages of energy efficiency measures being offered to qualifying low-income households. The project will address: 1) home assessment and domestic water distribution system selection barriers; and 2) installation barriers and potential pitfalls. Even though the major emphasis will be assessment, selection and installation barriers, actual energy and water usage data will be collected and utilized in assessing associated energy and water savings. Less effort is being placed on cost effectiveness (savings

derived from the use of tankless water heaters) since the California Energy Commission (CEC) and Lawrence Berkeley National Laboratory (LBNL) are also addressing the savings issue; however, the void in their effort is those barriers unique to low-income customers, such as system type and location, structural problems, and delayed maintenance, all of which will be investigated in this project. Information derived from this project will be shared with, and gathered from, other tankless water heater researchers.

## 1.4 Action Plan

CAASMC is proposing a field component and a laboratory component for its tankless water heater pilot. The field component will allow CAASMC to identify real world field barriers associated with the installation of tankless water heaters. It will also include the acquisition of before and after usage data via installing water flow and energy metering devices.

As with all weatherization measures included in both the LIEE and CSD weatherization programs, weatherization standards and policies and procedures are an integral part of the management tools. The major components of both these documents are the assessment and measure feasibility criteria. An assessment tool will be developed to identify real world field barriers and measure feasibility criteria. This field information will be collected during the pilot study via a twenty home survey and included in the final report. It will also be used in developing measure-specific standards and

Policies and Procedures if the measure is incorporated into the weatherization programs.

In addition to the field data, a side-by-side laboratory study will be conducted for an older 40-gallon water heater and a tankless water heater. A side-by-side computer controlled test/study will be designed and implemented under laboratory conditions that enable CASSMC to determine the following:

- Energy usage of a 40 gallon gas water heater
- Water saved by reducing the warm up time
- Gas saved by the elimination of a pilot
- Gas/electricity saved by reducing tank loss

To ascertain the information/data needed to produce answers, CASSMC will:

1. Install two side-by-side units.
    - One (1) 40 gallon tank unit
    - One (1) tankless and pilotless unit
2. Equip both installations with: 1) gas and water meters; and 2) electric controlled water valves. Valves will be installed a distance away from the water heater to be representative of most pipe runs in low-income homes.
3. Design a data acquisition and control system that simulates water usage of a four-member family by opening valves and allowing water to run for a period similar to what would occur in a typical family operation.
4. Operate the side-by-side units for a thirty-day test period.

5. Data will be downloaded from the data acquisition system, compiled into a database, and analyzed to determine the amount of energy and water savings derived from the installation of a tankless unit.

### 1.5 Timeline

The pilot is scheduled to run for a 15-month period (January 1, 2006 through March 31, 2007). The data collection period of the study will be conducted over a nine month period after the physical installation of the tankless water heaters.

## 2. TARGET POPULATION

The target population will be CAASMC weatherization qualified participants living in single-family homes.

## 3. CLIENT EDUCTION AND SETTING

Each household will receive education about the benefits of tankless water heaters and will receive training that will teach them how to operate and maintain the unit, and how to assess problems. These units require minimal maintenance (replacement of batteries in the spark igniter) which will be shown to the occupants. The homeowner will receive all manufacturers' pamphlets and information included in the packaging of the tankless water heater.

## 4. INSTALLATION PARAMETERS

The tankless water heaters will be installed according to the manufacturer's instructions and local building codes. Since no LIEE or CSD Weatherization Standards currently exist for tankless water heaters, CAASMC and the third-party consultant will closely monitor the installation process to identify items to be included in future standards, should this item be included in the package of measures to be installed through LIEE or CSD programs.

## 5. QUALITY CONTROL

CAASMC will contract with a third-party consultant to provide the quality control for the installation. The consultant will produce a tankless water heater installation check-list; provide training to CAASMC's weatherization crews on how to install the devices, and inspect each installation to ensure proper installation. CAASMC will contact participants on a monthly basis to assess customer satisfaction and to make any necessary temperature adjustments on the tankless water heaters.

## 6. DATA COLLECTION METHODOLOGY

CAASMC will collect demographic information for participants during the intake process. All materials and labor costs associated with the installation of the water heaters will be recorded and tracked to determine actual cost of installation.

CAASMC will contract with a third-party consultant to monitor the installed devices. The consultant will monitor water and gas usage for a period of time to ascertain

the energy savings potential of the product and also conduct a customer satisfaction survey to determine if the product meets the household's expectations for delivery of hot water as needed.

## 7. PERFORMANCE GOALS

**7.1** Install five (5) tankless water heaters in single family dwelling

**7.2** Monitor and evaluate customer satisfaction and product effectiveness on a monthly basis

**7.3** Complete feasibility study on effectiveness of tankless water heaters

## 8. CSD REPORTING REQUIREMENTS

CAASMC will provide accurate and timely fiscal reports to CSD on a monthly basis and program reports on a quarterly basis.

## 9. LEVERAGING OPPORTUNITIES

CAASMC will leverage funds with LIHEAP, DOE, PVEA weatherization programs and with the PG&E leveraging contract.

## 10. REINFORCEMENT AND/OR FOLLOW-UP ACTIVITIES

Customers shall be contacted monthly after the installation of tankless water heater to determine customer satisfaction and product effectiveness.

## 11. BUDGET ITEMS

The following budget is based upon leveraging of this pilot program with additional funding from the California Department of Community Services and Development (CSD). The following is a summary of all tasks and associated costs for the share related to PG&E only.

1. Develop Water Distribution System Requirements ..... $ 2,400.00
   A. Existing standards
   B. Existing pipe size layout (gas and water)
   C. Condition of system
2. Develop Assessment Tool with the following components: ..... $ 4,160.00
   A. Home assessment
   B. Family demographics
   C. Water usage pattern
   D. Water distribution system
      - Type
      - Size
      - Condition
3. Income-qualify a pool of low-income families (Outreach) ..... $ NO COST
      - Four or more occupants
      - Single-family home
4. Assess 20 homes utilizing the Assessment Tool ..... $ 6,995.00
5. Select 5 homes to receive units + Installation ..... $ 3,000.00
6. Develop Monitoring Protocol ..... $ 3,315.00
   A. Monitoring equipment
   B. Data acquisition system
   C. Data download protocol
7. Develop Installation Criteria for Crews ..... $ 4,190.00
   A. Monitoring equipment
   B. Water heaters
   C. Customer training
8. Conduct Training ..... $ NO COST

9. Develop Side-by-Side Study ..... $ 13,898.00
   A. Develop study plan
   B. Select equipment
   C. Purchase equipment
   D. Develop control software
   E. Install system

10. Data Collection Monitoring ..... $ 11,060.00
   A. Download data daily (5 days)
   B. Download data weekly (5 weeks)

11. Develop Data Acquisition and Format for Assessment Data ..... $ 3,060.00

12. Final Report ..... $ 9,500.00

TOTAL BUDGET: $ 61,578.00

**PG&E Gas and Electric Advice**
**Filing List**
**General Order 96-A, Section III(G)**

ABAG Power Pool
Accent Energy
Aglet Consumer Alliance
Agnews Developmental Center
Ahmed, Ali
Alcantar & Elsesser
Anderson Donovan & Poole P.C.
Applied Power Technologies
APS Energy Services Co Inc
Arter & Hadden LLP
Avista Corp
Barkovich & Yap, Inc.
BART
Bartle Wells Associates
Blue Ridge Gas
Bohannon Development Co
BP Energy Company
Braun & Associates
C & H Sugar Co.
CA Bldg Industry Association
CA Cotton Ginners & Growers Assoc.
CA League of Food Processors
CA Water Service Group
California Energy Commission
California Farm Bureau Federation
California Gas Acquisition Svcs
California ISO
Calpine
Calpine Corp
Calpine Gilroy Cogen
Cambridge Energy Research Assoc
Cameron McKenna
Cardinal Cogen
Cellnet Data Systems
Chevron Texaco
Chevron USA Production Co.
Childress, David A.
City of Glendale
City of Healdsburg
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CPUC
Cross Border Inc
Crossborder Inc
CSC Energy Services
Davis, Wright, Tremaine LLP
Defense Fuel Support Center
Department of the Army
Department of Water & Power City
DGS Natural Gas Services
Douglass & Liddell
Downey, Brand, Seymour & Rohwer
Duke Energy
Duke Energy North America
Duncan, Virgil E.
Dutcher, John
Dynegy Inc.
Ellison Schneider
Energy Law Group LLP
Energy Management Services, LLC
Enron Energy Services
Exelon Energy Ohio, Inc
Exeter Associates
Foster Farms
Foster, Wheeler, Martinez
Franciscan Mobilehome
Future Resources Associates, Inc
G. A. Krause & Assoc
Gas Transmission Northwest Corporation
GLJ Energy Publications
Goodin, MacBride, Squeri, Schlotz &
Hanna & Morton
Heeg, Peggy A.
Hitachi Global Storage Technologies
Hogan Manufacturing, Inc
House, Lon
Imperial Irrigation District
Integrated Utility Consulting Group
International Power Technology
Interstate Gas Services, Inc.
IUCG/Sunshine Design LLC
J. R. Wood, Inc
JTM, Inc
Kaiser Cement Corp
Luce, Forward, Hamilton & Scripps
Manatt, Phelps & Phillips
Marcus, David
Masonite Corporation
Matthew V. Brady & Associates
Maynor, Donald H.
McKenzie & Assoc
McKenzie & Associates
Meek, Daniel W.
Mirant California, LLC
Modesto Irrigation Dist
Morrison & Foerster
Morse Richard Weisenmiller & Assoc.
Navigant Consulting
New United Motor Mfg, Inc
Norris & Wong Associates
North Coast Solar Resources
Northern California Power Agency
Office of Energy Assessments
Palo Alto Muni Utilities
PG&E National Energy Group
Pinnacle CNG Company
PITCO
Plurimi, Inc.
PPL EnergyPlus, LLC
Praxair, Inc.
Price, Roy
Product Development Dept
R. M. Hairston & Company
R. W. Beck & Associates
Recon Research
Regional Cogeneration Service
RMC Lonestar
Sacramento Municipal Utility District
SCD Energy Solutions
Seattle City Light
Sempra
Sempra Energy
Sequoia Union HS Dist
SESCO
Sierra Pacific Power Company
Silicon Valley Power
Smurfit Stone Container Corp
Southern California Edison
SPURR
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Tecogen, Inc
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U S Borax, Inc
United Cogen Inc.
URM Groups
Utility Cost Management LLC
Utility Resource Network
Wellhead Electric Company
Western Hub Properties, LLC
White & Case
WMA