*Title:*

# LODGING INDUSTRY ENERGY EFFICIENCY PROGRAM FOR SoCalGas SERVICE TERRITORY

*Submitted to:*

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

*Date Submitted*:

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*Contact Person:*

Mr. Ivan Varadi
AEV, Inc.
1180 South Beverly Drive
Los Angeles, California 90035
Telephone: 310-553-5285
e-mail: aev.ivan@sbcglobal.net

*Other Programs Proposed*:

Lodging Industry Energy Efficiency Program
for PG&E Service Territory

Lodging Industry Energy Efficiency Program
For SCE Service Territory

Public Swimming Pool Pump Energy Efficiency Program
For PG&E Service Territory

Public Swimming Pool Pump Energy Efficiency Program
For SCE Service Territory

**AEV, Inc.**
**Consulting Engineers**
*1180 South Beverly Drive, Suite 600*
*Los Angeles, California 90035*

*Tel: (310) 553-5285*
*Fax: (310) 300-0098*

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# I. PROGRAM OVERVIEW

## I.A PROGRAM CONCEPT

AEV, Inc. (AEV) proposes to implement a Lodging Industry Energy Efficiency Program as a Local Non-Utility Nonresidential Energy Efficiency Program in the service territory of Southern California Gas Company (SoCalGas) for Program Years 2004 and 2005. The Lodging Industry Energy Efficiency Program is focused on improving energy efficiency for small lodging facilities by directly installing low flow showerheads throughout the lodging facilities that participate in the program.

## I.B PROGRAM RATIONALE

Most small hotels and motels in SoCalGas's service territory are owned and operated by individuals whose primary interest and concentration are on maintaining a profitable operation. With their primary focus on running their business, owners and operators of small hotels and motels generally do not have the time available to attend seminars or to read and digest materials mailed to them. Complicating this picture is the fact that many owners/operators of small hotels and motels are first-generation immigrants for whom English is not their first language. Because of these various reasons, owners/operators of small hotels and motels are a hard-to-reach market. Nevertheless, most owners of small hotels and motels are business-savvy and responsive to ways to reduce their costs or improve the quality of service they offer their customers.

Because of previous work performed for Southern California Gas Company, information is available identifying small lodging facilities in SoCalGas's service territory who have indicated their interest in having low-flow showerheads installed. Thus, the Lodging Industry Energy Efficiency Program uses a targeted, direct install approach through which we directly install low-flow showerheads at these already-identified lodging facilities.

Note that we are also proposing a Lodging Industry Energy Efficiency Program for the service territory of Southern California Edison. Under that program, we would directly install compact fluorescent lamps to replace incandescent lamps in hotel rooms. If we are selected to perform both programs, the work efforts would be coordinated to deliver both types of measures as appropriate.

## I.C PROGRAM OBJECTIVES

The primary objective for the Lodging Industry Energy Efficiency Program is to provide long-term gas savings by directly installing low-flow showerheads in small hotels and motels that have expressed their interest in having such showerheads installed. A summary of the quantitative objectives for the proposed Lodging Industry Energy Efficiency Program in SoCalGas's service territory is provided in Table I-1.

*Table I-1. Summary of Quantitative Objectives for Lodging Industry Energy Efficiency Program in Service Territory of SoCalGas*

| | |
|---|---|
| **Program Name** | Lodging Industry Energy Efficiency Program |
| **Utility Service Territory** | SoCalGas |
| **Program Type** | Direct Install |
| **Target Sector** | Lodging |
| **NR Customer Size** | Very small and small |
| **Performance Target** | 30,000 low-flow showerheads installed in lodging facilities |
| **Annual kWh Savings Target** | N/A |
| **Annual Peak kW Reduction Target** | N/A |
| **Annual Therm Savings Target** | 501,840 therms |
| **Total Program Budget** | $963,000 |
| **TRC** | 3.13 |
| **PT** | 9.00 |

Besides its energy savings objectives, the Lodging Industry Energy Efficiency Program has other considerations recommending its implementation.

- It has strong equity considerations in that it is targeted toward a segment of the market that has traditionally been hard to reach with other programs.
- It is an innovative program, using a one-to-one marketing approach to improve energy efficiency for small hotels and motels.

# II. PROGRAM PROCESS

## II.A PROGRAM IMPLEMENTATION

Implementing the Lodging Industry Energy Efficiency Program involves (1) contacting those hotels and motels previously visited under SoCalGas's Lodging Industry Energy Education Program, (2) recruiting these hotels/motels to have low-flow showerheads installed, and (3) actually installing the low-flow showerheads. Our marketing plan for achieving the first step is described in Section II.B. Our approach to the other two steps is discussed in this section.

Upon arriving at a hotel or motel to recruit them for the program, we first work with the hotel/motel owner/operator to determine the feasibility of replacing existing showerheads with low-flow showerheads. We work with the owner/operator to measure the flow rate of showers in typical guest rooms. We use this measurement to illustrate the amount of energy that can be saved by using low-flow showerheads.

Based on data that collected during previous work on SoCalGas's Lodging Industry Energy Education Program, the average flow rate for showerheads in small hotels/motels is about 2.7 gallons per minute. (This value is calculated from measured data collected at nearly 1,200 small hotels/motels during the SoCalGas program.) Significant energy savings can be achieved by installing showerheads with a flow rate of 1.7 gallons per minute. Moreover, considerable reductions in water use and sewer charges also result from using low-flow showerheads.

Following this presentation, we get the approval of the owner/operator for our direct installation of low-flow showerheads throughout the hotel/motel's rooms. We have the owner/operator sign an agreement that authorizes us to install the low-flow showerheads throughout the guest rooms in the hotel/motel. After obtaining the signed agreement, we undertake the installation of the low-flow showerheads in all of the guest rooms.

We make a follow-up call to each owner/operator at 4 weeks after the site visit. Through this call, we determine whether there have been any problems with the showerheads.

## II.B MARKETING PLAN

Under previous work for Southern California Gas Company (the Lodging Industry Education Program), nearly 1,300 small hotels and motels in SoCalGas's service territory were visited on-site and energy efficiency improvements that they could make were identified. Typically, the decision-makers at the hotels/motels were most interested in low flow showerheads and compact fluorescent lighting. Moreover, measurements of water flow rates for showerheads in these hotels and motels showed that there was good potential for energy savings if they were replaced with low-flow showerheads.

Because these hotels and motels have already been visited once and provided information about energy efficiency, the marketing plan for the proposed Lodging Industry Energy Efficiency Program involves again contacting them and recruiting them to have low-flow showerheads installed.

We re-contact each of the owners/managers of the small hotels or motels previously visited through telephone. We remind them of the previous energy efficiency visit and inform them of the new offer of replacing all of the showerheads in their hotels/motels with low-flow showerheads.

## II.C CUSTOMER ENROLLMENT

The customer enrollment process for the Lodging Industry Energy Efficiency Program is straightforward in that a small hotel or motel is enrolled into the Program at the time of the on-site visit to install the showerheads.

## II.D MATERIALS

The low-flow showerheads that we install through the Lodging Industry Energy Efficiency Program will meet the following specifications:

- Unit shall output no more than 1.7 gallons per minute
- Unit shall have standard FPT to fit a standard MPT shower assembly
- Unit shall have an integral ball joint to allow the shower head to move in different directions.
- Units output shall not vary even in water pressure varies.
- Units shall come in chrome or white coloring
- Units shall have a manufacturers 90 day warranty

We procure the low-flow showerheads by soliciting bids from suppliers. Candidate suppliers include the following:

- Ferguson
- Cal Steam
- Slakey Brothers
- Home Depot
- Wal-Mart
- Orchard Supply Hardware

## II.E PAYMENT OF INCENTIVES

No direct incentives are paid to the small hotels and motels that participate in the Lodging Industry Energy Efficiency Program. Rather, hotels and motels have low-flow showerheads directly installed at no cost to them.

## II.F STAFF AND SUBCONTRACTOR RESPONSIBILITIES

Our staffing structure and responsibilities for the Lodging Industry Energy Efficiency Program are shown in Table II-1.

*Table II-1. Staffing Structure and Responsibilities*

| ***Name*** | ***Title*** | ***Responsibilities*** | ***% Available*** |
|---|---|---|---|
| Meir Ezer | President – AEV, Inc. | Administrative / Technical Advisor | 15% |
| Ivan Varadi | Vice President – AEV, Inc. | Project manager - day to day project supervision | 20% |
| Technician | AEV Field Staff | Field staff | 100% |
| Technician | AEV Field Staff | Field staff | 100% |
| Technician | AEV Field Staff | Field staff | 100% |
| Technician | AEV Field Staff | Field staff | 100% |
| Safdar Chaudhry | Associate - ADM Associates, Inc. | Field trainer / supervisor | 10% |
| Mahmoud Fouladi | Associate - ADM Associates, Inc. | Field supervisor | 20% |

## II.G WORK PLAN AND TIMELINE FOR PROGRAM IMPLEMENTATION

Our proposed timeline for implementing the Lodging Industry Energy Efficiency Program in SoCalGas's service territory is shown in Table II-1. This timeline is for a program covering PY 2004 and PY 2005.

*Table II-1. Timeline for Implementing Lodging Industry Energy Efficiency Program in the Southern California Gas Co. Service Territory*

| ***Activity*** | ***Target Date*** |
|---|---|
| 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

The Lodging Industry Energy Efficiency Program is targeted at owners/operators of small hotels/motels in the service territory of Southern California Gas Company. Based on our previous work with hotels and motels in southern California, most of the targeted hotels and motels will have individual owners. Moreover, we expect that nearly three-fourths of the targeted lodging facilities will be the only one owned by the particular owner/operator.

The owners/operators of the targeted hotels/motels were informed of the advantages of low-flow showerheads through previous work undertaken for SoCalGas. However, follow-up surveying of these owners/operators revealed that many had not changed their showerheads. The reason given for not making the change was that they did not have the financial resources to do so, even during the period when there were rebates available for low-flow showerheads.

## III.B CUSTOMER ELIGIBILITY

Hotels/motels that are eligible for the Lodging Industry Energy Efficiency Program are those previously visited under Southern California Gas Company's Lodging Industry Energy Education Program. There are about 1,300 such hotels and motels in SoCalGas's service territory.

## III.C CUSTOMER COMPLAINT RESOLUTION

To allow for customer questions or complaints, we establish a toll-free ("800") telephone line that can be accessed by small hotels and motels in SoCalGas's service territory. Firms can use this line to request information about the Lodging Industry Energy Efficiency Program, to request a visit, or to place a complaint. 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 SoCalGas 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 SoCalGas.

## III.D GEOGRAPHIC AREA

We are proposing to implement the Lodging Industry Energy Efficiency Program in SoCalGas's service territory.

# IV. MEASURE AND ACTIVITY DESCRIPTIONS

## IV.A ENERGY SAVINGS ASSUMPTIONS

The low-flow showerheads that will be installed through the Lodging Industry Energy Efficiency Program provide gas savings. Estimates for the gas savings from installation of a low-flow showerhead are available in the DEER database. However, we use estimates of savings that are based on the data on showerhead flow rates that were gathered in previous work for SoCalGas. These data were collected for 1,300 hotels/motels. We have estimated savings for the low-flow showerheads using (1) estimates of baseline flow rates developed from the data previously collected, (2) assumptions about the flow rates of the low-flow showerheads that will be installed as replacements, (3) average number of showers taken a year in a hotel/motel room, (4) average temperature of hot water, (5) distribution losses, and (6) water heater efficiency.

## IV.B DEVIATIONS IN STANDARD COST-EFFECTIVENESS VALUES

None of the cost-effectiveness variables that we have used deviate in value from those prescribed in the Energy Efficiency Policy Manual or the CEC's DEER database.

## IV.C REBATE AMOUNTS

Low-flow showerheads will be directly installed through the Lodging Industry Energy Efficiency Program. No rebates are made for the showerheads.

## IV.D ACTIVITIES DESCRIPTIONS

There are no other activities in the Lodging Industry Energy Efficiency Program that are expected to produce measurable energy savings.

# V. GOALS

The overall goal for the Lodging Industry Energy Efficiency Program is to deliver energy efficiency services to small lodging facilities in SoCalGas's service territory according to the installation and gas savings numbers shown in Table V-1.

*Table V-1. Targets for Numbers of Businesses and Gas Savings for Lodging Industry Energy Efficiency Program in SoCalGas Service Territory*

| ***Program Year*** | ***Numbers of Showerheads*** | ***Gas Savings (Therms)*** |
|---|---|---|
| PY 2004 | 12,000 | 200,740 |
| PY 2005 | 18,000 | 301,100 |
| Total | 30,000 | 501,840 |

# 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 Lodging Industry Energy Efficiency Program and to reporting on program progress.

AEV will contract with an independent third party who is not affiliated with AEV to evaluate the Lodging Industry Energy Efficiency 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. Two types of data are needed.

- Savings per showerhead installed; and
- Number of showerheads installed.

Because low-flow showerheads are a standardized energy efficiency measure, we expect that deemed savings values can be stipulated (e.g., from DEER) can be used for the installed measures.

We use a tracking system to keep track of the number of small hotels and motels at which low-flow showerheads were installed and the numbers of showerheads installed. During the implementation of the program, we collect data on participants that we enter into a program tracking system. We already have a system for tracking the work that is based on previous work that we performed for hotels and motels in southern California. 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 our implementing the Lodging Industry Energy Efficiency 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:

- Name and address of each lodging facility visited;
- Basic characteristics of hotel/motel (e.g., number of rooms);
- Occupancy rate;
- Number of low-flow showerheads installed at each hotel/motel;
- Flow rates of showerheads replaced; and
- Average temperature of hot water.

At the end of the program, we provide the data in the tracking system to the selected EM&V contractor to support the preparation of an evaluation of the program's effects. This evaluation will include information about all activities undertaken as part of the program, including the number of hotels/motels that received services through the Lodging Industry Energy Efficiency Program and the specifics on the showerheads installed at each. Estimates of savings are also provided for each hotel/motel.

## VI.B POTENTIAL EM&V CONTRACTORS

Potential EM&V contractors for the Lodging Industry Energy Efficiency 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 Lodging Industry Energy Efficiency Program.

# VII. DESCRIPTION OF QUALIFICATIONS

This section provides information on the qualifications of AEV, Inc. (prime implementor), ADM Associates (subcontractor) and of the personnel who will be the staff for the Lodging Industry Energy Efficiency Program.

## VII.A QUALIFICATIONS OF AEV, INC. (PRIME IMPLEMENTOR)

AEV's ability to implement the Lodging Industry Energy Efficiency Program is based on our considerable experience in working with small business firms to improve energy efficiency.

AEV Associates, Inc. (AEV) is a consulting engineering firm with over 45 years of experience in the design of building Mechanical & Electrical systems. We enjoy a national reputation as an organization of highly-trained professional engineers that take pride in providing innovative and cost effective designs, using the latest engineering knowledge and analytical tools. The firm has provided engineering services for over 2,000 projects with a construction cost of over one billion dollars.

Our goal is to design the systems within the construction budgets of our clients utilizing the unique mix of qualifications of our staff. Our philosophy in conducting business is: (1) Dedication to serving our clients needs, (2) Sound business management, (3) State of the art energy efficient design of systems, (4) Reduced construction costs by creative use of our extensive experience, and (5) utilized state funds to enhance our design at no cost to the client.

AEV operates under the leadership of Meir Ezer, P.E. as President and Director of Engineering. The Plumbing & Fire Protection Division is headed by Ivan Varadi, C.I.P.E., Vice President. AEV offers services in master planning, feasibility studies, preliminary design, preparation of construction documents, cost estimating, construction administration and building commissioning service. Specific specialties include: (1) the design of heating, ventilating, and air-conditioning (HVAC) systems, central heating/cooling plants, and (2) plumbing, sanitation process piping and fire protection sprinkler systems. AEV provides complete architecture and engineering services when the mechanical disciplines are the major component of the project.

AEV also provides research and energy related studies of buildings. AEV has resources available to conduct studies requiring computer simulations and analysis, and monitoring and evaluation of energy systems. AEV provides comprehensive design evaluations of alternative energy systems, and utilization of Utility and state funds for incorporation of energy efficiency into the design of building systems.

The following tables summarize recent projects performed by AEV, Inc.

| ***OFFICE BUILDINGS*** | |
|---|---|
| 150 Almaden - San Jose | 15 story, 600 Tons |
| 1901 Avenue of the Stars - L.A. | 20 story, 480,000 SF |
| Atlantic Pacific - L.A. | 30 story, 500,000 SF |
| California Bank - Beverly Hills | 12 story |
| Cannon Films Office Bldg. - L.A | 35,000 SF |
| Evans Product Building - Portland, OR | 18 story, 1800 Tons |
| Financial Plaza of Pacific - Honolulu-HI | 3 Bldgs, 7, 12, & 21 story |
| First National Bank of Oregon - Portland, OR | 40 story, 841,000 SF |
| Glendale Federal - Beverly Hills | 11 story HVAC renovation |
| Kaiser Permanente Medical Center - L.A | Remodel 3 story, 36,000 SF |
| Las Vegas office building - Las Vegas, NV | 2 story, 37,000 SF |
| One Wilshire - L.A. | 30 story, 670,000 SF |
| Pacific Gateway II - L.A | 10 story, 520 Tons |
| Rox-San - Beverly Hills | 10 story, HVAC renovation |
| Screen Actors Guild - Burbank | 8 story, 410 Tons |
| Sherman Terrace - L.A. | 5 story, 62,000 SF, 130 Tons |
| The City - Orange | 18 story, 400,000 SF |
| Wilshire Fairfax - L.A. | 16 story, 620 Tons |

| ***COMMERCIAL CENTERS*** | |
|---|---|
| Broadway Plaza - L.A. | Shopping Mall; 500 Room, 23 story Hotel; 32 story office, 723,000 SF |
| Broadway Department Stores | 16 locations each 160,000 SF |
| Culver Studios Parking - Culver City | 3 Level underground, 150,000 SF |

| ***HOTELS*** | |
|---|---|
| Beverly Hills Hotel - Beverly Hills | Master Plan & Remodel 300 rooms<br>Addition 150 Room, 4 story |
| Four Seasons - Newport Beach | 19 story, 600 Tons |
| Harrah's Lake Tahoe - Lake Tahoe, NV | Hotel & Casino 12 story |
| Hyatt Regency - Phoenix, AZ | 735 Room, 14 story, 600,000 SF |
| Hyatt Regency - Dearborn, MI | 700 Room, 14 story |
| La Mirada Holiday Inn - La Mirada | 8 story |
| MARINA Beach Hotel - Marina del Rey | 9 story |
| Marina Plaza Hotel - Marina del Rey | 9 story |
| Ritz Carlton - Laguna Niguel | 440 room, 4 story |

| | |
|---|---|
| | Addition & Remodel |
| Riviera - Las Vegas, NV | Addition 200 Room, 2 story |
| Sahara Reno - Reno, NV | Hotel & Casino |

***RESIDENTIAL***

| | |
|---|---|
| Century Park Apartments - L.A. | 480 Apartment, 20 story |
| Elysian Apartments - Long Beach | 200 Apartment, 13 story |
| Grand Promenade - L.A. | 406 Apartment, 25 story |
| | Office conversion to residential |
| Merv Griffin Residence - L.A. | 3 story, 40,000 SF |
| Skyline Phase II - L.A. | 250 Apartment, 14 story |
| Sunset Heights - L.A. | 200 Apartment, 13 story |
| The Corinthian - L.A. | 18 story |
| The Diplomat, L.A. | 18 story, 177,000 SF |
| The Evian - L.A. | 34 story |
| Western Addition - San Francisco | 200 Apartment, 15 story |

***HOSPITALS***

| | |
|---|---|
| Beekman Hospital - New York, NY | 8 story, 1,800 Tons |
| Camarillo State Hospital - Camarillo | Remodel 5 wards |
| Cedars-Sinai Medical Center - L.A | Remodel Outpatient Imaging - 12,600 SF |
| | Addition Emergency Dept., 23,000 SF |
| | Remodel Emergency Facilities, 33,000 SF |
| Duke University Medical Center - Durham, NC | 2 Bldgs 5 & 8 story, 780,000 SF |
| Estelle Doheny Eye Hospital - L.A. | Addition, 4 story, 43,200 SF over 2 existing stories & garage |
| Hawthorne Community Hospital - Hawthorne | Addition, 80 Beds |
| Hoag Memorial Hospital - Newport Beach | MRI Facility, 5,000 SF |
| | Off Hour CHW System, 20 Tons |
| Inter-Community Medical Center - Covina | HVAC Evaluation, 1,590 Tons |
| Jewish Home for the Aged - Reseda | 99 bed, 3 story |
| La Mirada Hospital - La Mirada | 200 Bed |
| Martin Luther King Medical Center - L.A. | Remodel Neonatal Intensive Care |
| Methodist Hospital - Arcadia | 3 story |
| Metropolitan State Hospital - East | Remodel 3 story, 200,000 SF |

| | |
|---|---|
| Norwalk | |
| Metropolitan State Hospital - West Norwalk | Remodel, 3 story |
| Rancho Los Amigos Medical Center - Downey | Patient Support, 3 story, 176,000 SF |
| Santa Ana Community Hospital - Santa Ana | Addition, 40 Beds |
| Santa Ana Medical Center - Santa Ana | 9,000 SF Addition |
| Sherman Oaks Community Hospital - Sherman Oaks | 3 story, Burn center |
| Sierra View District Hospital - Porterville | Patient tower 6 story, 85,000 SF |
| | Addition/Remodel, ER & utilities |
| | Remodel ETO sterilizer |
| Temple Hospital - L.A. | Remodel, 3 story |
| Timken-Surges Research Lab - La Jolla | Addition, 50,000 SF |
| University of Wisconsin Medical Center - Madison, WI | 2,600,000 SF |
| Veterans Administration Hospital - Long Beach | Remodel, 3 story |
| Veterans Administration Hospital - Loma Linda | 500 Bed, 640,000 SF |
| Veterans Administration Hospital - WLA | Addition & Remodel 15,000 SF |
| | Replace emergency generator |
| | cooling tower |

***UNIVERSITIES & COLLEGES***

| | |
|---|---|
| California State University - Fullerton | Auditorium/Fine Arts, 1,200 Seats 92,000 SF |
| | Audio Visual Center & Library 7 story, 210,000 SF |
| California State University - Long Beach | Engineering & Computer Science, 6 story with ice storage |
| California State University - L.A | Remodel Biological Science, 3 story 15,000 SF |
| | Library 5 story, 280,000 SF |
| California State University - Pomona | Music building, 2 story, 26,000 SF |
| California State University - San Bernardino | Central CHW Plant, 3,200 Ton additions, 1,100,000 gal. TES |
| | University Hall, 5 story, 135,000 SF |
| | Campus DOC Energy Management System |
| | Energy Improvement HTHW |

| | |
|---|---|
| | System & CHW distribution |
| California State University - San Jose | Engineering & Computer Science,<br>4 story addition 171,000 SF<br>3 story remodel 153,000 SF |
| Occidental College - L.A | Central Heating Plant Renovation |
| Stanford University - Palo Alto | Library 5 story, 330,000 SF<br>Dorm Heating Plant |
| University of California - L.A. | Arts Complex: 1200 & 200 seat theaters, support area & art gallery<br>Remodel SEAS Boelter Hall, 7 story, 61,500 SF<br>Remodel Ueberoth Bldg<br>Library 260,000 SF; Biology 150,000 SF<br>Remodel Faculty Center, 18,000 SF<br>Remodel Murphy Hall-residence<br>Hospital Telecommunication Center |
| University of California - San Diego | Fine Arts 91,000 SF |
| University of California - Santa Barbara | Engineering 5 story 180,000 SF<br>Drama 400 Seats<br>Office 68,000 SF<br>Residence Halls, 1400 units |
| University of Hawaii - Honolulu, HI | Library 4 story, 107,00 SF |

***JUNIOR/MIDDLE, HIGH SCHOOLS***

| | |
|---|---|
| ***LAUSD*** | |
| Bancroft Junior High | |
| Belmont High | |
| Hale Middle | Air Conditioning Addition |
| Washington High | Air Conditioning Upgrade |
| Westchester High | Reconstruction |
| | |
| Culver City High - Culver City | Addition |
| Lompoc High - Lompoc | |
| North High - Santa Maria | |
| Quartz Hill High - Lancaster | |
| South High - Torrance | Gymnasium |
| Torrance High - Torrance | Administration Building<br>New Heating Facilities |

| ***ELEMENTARY SCHOOLS*** | |
|---|---|
| ***LAUSD*** | |
| Arlington | |
| Berendo | |
| Cahuenga | Bond Repair/Reconstruction |
| Canoga Park | |
| Castelar | Bond Repair/Reconstruction |
| Cienega | |
| Darby | Air Conditioning Addition |
| Herrick Street | |
| Justice Street | |
| Langdon Avenue | |
| Osceola Street | |
| San Pedro | |
| Sherman Oaks | Air Conditioning Addition |
| Sierra Park | |
| Superior Street | |
| Trinity | |
| Woodcrest | Reconstruction |
| Woodland Hills | Air Conditioning Addition |
| Horace Mann - Beverly Hills | |
| Madison - Torrance | |

| ***PRIVATE SCHOOLS*** | |
|---|---|
| Art Center - L.A | |
| Campbell Hall - North Hollywood | |
| Hillel Hebrew Academy - Beverly Hills | 3 story and subterranean parking |
| McKinley Home for Boys - San Dimas | |
| School of the Handicapped - L.A | |

| ***THEATERS & ENTERTAINMENT CENTERS*** | |
|---|---|
| Beaver Creek Center of the Arts-Beaver Creek, CO | 519 seat Community Theater & Art gallery |
| California State University - Fullerton | Audio Visual Center & Library, 2 story, 210,000 SF |
| California State University - L.A | Full Stage Theater, 1,200 seats |
| California State University - Pomona | Music 2 story, 26,000 SF |
| Cannon Film Recording Studios - L.A | 40,000 SF |
| Century City Entertainment Center - L.A | 2 Theaters & Shopping Center |
| Compact Video Entertainment Center - L.A | 7 story, 120,000 SF |
| Dance Gallery - L.A | Dance Complex, 77,000 SF 8,500 |

| | |
|---|---|
| | SF |
| Edwards Film Theaters - Alhambra | |
| Edwards Film Theaters - La Verne | |
| Edwards Film Theaters - Mission Viejo | |
| Forum - Inglewood | Sports Arena, 17,500 seat |
| Hayashi Recording Studios - L.A | 4,000 SF |
| Honolulu Municipal Stadium - Honolulu, HI | 500 seats |
| Laemmle 7 Plex Cinema - Pasadena | |
| Mann Film Theaters - El Monte | |
| Mann Film Theaters - San Diego | |
| Twentieth Century Fox - L.A | Drama 400 seats & Office 68,000 SF |
| University of California - San Diego | Fine Arts, 91,000 SF |
| University of California - Santa Barbara | Remodel, 75,000 SF |
| Warner Brothers Studios - L.A. | 2 story, 10,000 SF |

| ***MILITARY, INDUSTRIAL & SPECIAL PROJECTS*** | |
|---|---|
| Air National Guard Facilities - Point Mugu | 84,000 SF |
| Beckman Laser Institute, UCI - Irvine | 140 Tons |
| Camp Pendleton | BEQ<br>Mess Hall |
| Flight Simulator - El Toro | 2 story, 250 Tons |
| General Motors - Van Nuys | Paint Facility, 6,000 Tons, 900,000 CFM |
| George Air Force Base - Victorville | Service Building |
| Long Beach-Los Angeles Rail Transit Shops (Blue Line) | Car Maintenance, 120,000 SF |
| L.A. County Museum - L.A. | Remodel & Addition |
| Marine Corps Airfield | Aircraft Training |
| Norton Air Force - Norton | 4 story |
| Norwalk-El Segundo Rail Transit Shops (Green Line) | Car Maintenance |
| Point Mugu Naval Airfield - Point Mugu | Technical Building |
| Sarah Mellon Sciff Pavilion - Pittsburgh, PA | 150,000 SF |
| Turf Paradise - Phoenix, AZ | Race Track |

| ***CORRECTIONAL FACILITIES*** | |
|---|---|
| 77th Street Regional Police Facility - L.A | Police & Jail 200 bed, 106,700 SF |
| Alhambra Police Facility - Alhambra | Police & Jail, 46 bed, 56,400 SF |
| Chuchawalla Valley State Prison - Riverside | Corrections to Thermal Fluid System |
| Contra Costa/West County Justice Ctr - Martinez | Detention Facility, 232,000 SF |
| Imperial County Prison - North | 4,200 Ton Central CHW Plant & Propane Systems |
| Imperial County Prison - South | 4,400 Ton Central CHW Plant Emergency Generator & Propane Systems |
| Los Angeles Reception Center - L.A | Detention Facility 1,450 bed, 520,000 SF |

| ***REHABILITATION & HVAC SYSTEM UPGRADES*** | |
|---|---|
| Atlantic Richfield Plaza - L.A. | Office, two 52 story Towers |
| Beverly Hills Hotel - Beverly Hills | Energy Utilities Master Plan |
| Glendale Federal Building - Beverly Hills | Office, 10 story, 500 Tons |
| LACO South Central Social Services - L.A | Office, 2 story, 200 Tons |
| LACO Lincoln Heights Social Services - L.A | Office, 2 story, 120 Tons |
| Long Beach Water Department - Long Beach | Office, 4 story |
| Music Center/Mall Garages - L.A | Supply & Exhaust systems |
| Pacific Telephone Company - LA | Utility, 2 story |
| Rox-San Building - Beverly Hills | Office, 10 story, 160 Tons |
| State of California - Sacramento | Office, 4 story, 270,000 SF |

| ***SHOPPING CENTERS/RETAIL FACILITIES*** |
|---|
| Emporio Armani - Beverly Hills |
| Fontana Shopping Center - Fontana |
| Gardena Mall - Gardena |
| Giorgo Armani - Beverly Hills |
| Grand Terrace Shopping Center - Grand Terrace |
| Guess - Beverly Hills |
| Hemet Shopping Center - Hemet |

| |
|---|
| Palmdale Shopping Center - Palmdale<br>Redlands Shopping Center and Theaters - Redlands<br>Riverside Shopping Center - Riverside<br>Victorville Shopping Center - Victorville |

| ***RELIGIOUS INSTITUTIONS*** | |
|---|---|
| Calvary Church of Pacific Palisades | Sanctuary & Classroom Complex, 100,000 SF |
| Church of Jesus Christ of the Latter Day Saints - Van Nuys | |
| Church of the Nazarine - Houston, TX | |
| Church of the Nazarine - Garden Grove | |
| Lutheran Church - Anaheim | |
| Maria Regina Korean Apostle Church - Torrance | |
| Self Realization Fellowship - Pacific Palisades | |
| Temple Beth Shalom - Whittier | |
| Temple Judea - Encino | |

| ***CENTRAL PLANTS*** | |
|---|---|
| California State University - San Bernardino | 3,200 ton refrigeration with 1,100,000 gallon CHW storage<br>Campus DOC energy management system<br>Campus energy improvement HTHW system & CHW distribution |
| Imperial County State Prison, North | 4,200 ton refrigeration CHW plant distribution & propane system |
| Imperial County State Prison, South | 4,400 ton refrigeration CHW plant & propane system |
| Occidental College - L.A | 9800 MBH co-generator and boiler plant |

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| ***STUDIES*** | |
|---|---|
| 9454 Wilshire Blvd. Office Building - L.A. | HVAC Master Plan |
| Alhambra Police Facility - Alhambra | Energy Efficient measures |
| California State University - San Bernardino | Chilled Water Master Plan |

| | |
|---|---|
| | Campus Energy Management Feasibility |
| Four Seasons Hotel - Newport | Thermal Storage |
| Hillel Hebrew Academy - Beverly Hills | HVAC Master Plan |
| Intercommunity Medical Center - West Covina | Evaluation of HVAC Systems |
| Occidental College - LA | Chilled Water Master Plan<br>Steam Master Plan |

***RESTAURANTS***

Camachos Restaurant - Universal City Walk
Depot Restaurant - Torrance
Gladstones - Universal City Walk
Health Research, ER Restaurant - Los Angeles
Perfectly Sweet - Alhambra
Rialto Cafe - Torrance
Suzuki Restaurant - Inglewood
Western Bagel - Burbank, Chatsworth, Granada Hills, Northridge
Wizard - Universal City Walk

| ***Commissioning Projects*** | |
|---|---|
| ***Project Name / Location*** | ***Description of Commissioning Activities*** |
| Koss Wil Center | Chiller Test |
| 1990 Ave. of the Stars | Garage Ventilation CO control system |
| MaMaison Hotel | AHU Variable Air Volume System |
| Cal Mart | Chiller system test |
| 6500 Wilshire Blvd | AHU Variable Air Volume System |
| CBS - TES | Ice Storage system test. |
| 6464 Sunset Blvd. | Chiller and VAV AH systems |
| Porter - Manufacturer | Chiller and VAV AH systems |
| Union Center | AHU Variable Air Volume System |
| USC | AHU System |
| 660 South Figuroa | AHU Variable Air Volume System |
| Westwood GTY | AHU Variable Air Volume System |
| JCP Northridge | HVAC System, Chiller AHU & Pumps |
| JCP Canoga Park | Chiller system test |
| Eisenberg | Chiller system test |
| Warner Gaty | Air system test |
| Robinson May - Loral | Chiller system test |

| | |
|---|---|
| Robinson May - Eagle | Chiller system test |
| El-Capitan | Chiller and Ice Storage system test |
| 77th Street Police Facility | Complete HVAC test |
| Envest - GSA Holifield | HVAC system, cooling tower, and CO Garage exhaust system |

## VII.B QUALIFICATIONS OF ADM ASSOCIATES (SUBCONTRACTOR)

Since beginning business in 1979, ADM Associates, Inc. has worked with utilities throughout the country to implement large-scale programs to help small commercial firms use energy more efficiently. We have conducted programs to market energy efficiency services to small business firms for various clients, including the California Energy Extension Service, the Bonneville Power Administration, Entergy Services, Northern States Power, El Paso Electric, and Colorado Springs Public Utilities Department.

Our ability to inform owners/operators of small businesses about energy efficiency opportunities derives more generally from our hands-on experience in collecting and analyzing data on energy use for large numbers of commercial facilities.

- We have conducted energy audits on nearly 3,000 commercial and industrial facilities for such clients as Niagara Mohawk Power, Entergy Services, Northern States Power, El Paso Electric, Wisconsin Electric Power, Iowa Southern Utilities, Centerior Services Company, the Bonneville Power Administration. San Diego Gas and Electric, and Rochester Gas and Electric.
- We have conducted on-site surveys of nearly 10,000 commercial and industrial facilities for clients such as Entergy Services, Northern States Power, Union Electric, Central Illinois Public Service, Florida Power and Light, Alabama Power Company, El Paso Electric, the Bonneville Power Administration, Southern California Edison, Pacific Gas and Electric, the California Energy Commission, the Sacramento Municipal Utility District, San Diego Gas and Electric and other utility companies.

Following are brief descriptions of other projects where ADM has provided energy efficiency services.

- **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.

- **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.

- **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 planning 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.C DESCRIPTION OF EXPERIENCE FOR KEY PERSONNEL

Our staffing structure for the Lodging Industry Energy Efficiency Program was presented in Section II.F. Descriptions of the experience of the key personnel for the program are provided in this section.

**Meir Ezer, P.E.** is the President & Director of Engineering at AEV Associates, Inc. Mr. Ezer has extensive experience in various aspects of the design and construction supervision of building mechanical systems. Mr. Ezer has been in charge of mechanical design of new and rehabilitation of existing hospitals, medical centers, universities, hotels, casinos, office buildings, condominiums, shopping centers, recording studios, theaters, schools, indoor central bus terminal, and other buildings. The HVAC systems in the previous projects have included all types and sizes of equipment, conventional and highly specialized systems, and various types of solar heating systems. He is expert in the design, control and commissioning of large (over 4,000-ton) central cooling plants and over 3,000 Ton chiller plant with thermal energy storage (TES) systems. The commissioning projects have included the chiller system, the variable frequency drive for air handling units, the pumps & cooling tower, the Garage CO system, and direct digital control system. Some of the commissioning process uncovered improper operation of the variable frequency drives, numerous incorrect control settings and missing some of the control functions. Mr. Ezer received his B.S. in mechanical engineering from the Israeli Institute of Technology, Haifa, Israel. He has completed courses towards an M.S. in Mechanical Engineering from Columbia University, New York. He is a register professional engineer in California, and Nevada, and a member of the American Society of Heating, Refrigerating, & Air Conditioning Engineers (ASHRAE).

**Ivan Varadi** is Vice President and Director of Plumbing and Fire Protection Engineering at AEV Associates, Inc. Mr. Varadi has over 28 years of experience in all aspects of the

design and construction supervision of mechanical, plumbing and fire protection systems for all types of buildings, including high-rise, office, industrial, commercial, institutional, hospitals, restaurants, residential complexes, hotels, movie theaters, and educational facilities. Before joining AEV, Mr. Varadi was a project engineer at Helfman/Haloossim and Associates (HHA), where his responsibilities included supervision of all mechanical, plumbing, fire protection and electrical engineering. Mr. Varadi received his B.S. in mechanical engineering from the College of Building Mechanical Engineering, Budapest, Hungary.

**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.

**Mahmoud Fouladi**, a Mechanical Engineer at ADM, has considerable experience in performing energy audits and building energy analysis, recommending energy efficiency measures and providing strategies for control systems for various commercial and industrial projects. He has been conducting quality control for the Mobile Energy Clinic that ADM has been conducting in the SCE and SCG service areas for the past two years. During the past seven years he has participated in more than ten major commercial & industrial data collection projects conducted by ADM. He has been conducting on-site data collection on commercial and industrial facilities as a member of the field staff for the Non-Residential Measure Retention Study that ADM has been performing for Southern California Edison for the past five years. Other projects that Mr. Fouladi has participated in include:

- Performed on-site data collection and monitoring of lighting and HVAC motrs for three projects conducted for Central Power and Light Co. in Texas.

- Performed on-site data collection for the evaluation of the New Commercial Construction Program conducted for Portland General Electric Co. The on-site data were used to develop DOE-2 simulations.
- Performed on-site data collection of commercial buildings for the Saturation Study conducted for Southern California Edison Co.

Mr. Fouladi earned his M.S. degree in Mechanical Engineering from George Washington University and his B.S. in Mechanical Engineering from Howard University.

# VIII. BUDGET

Our summary budget table for implementing the Lodging Industry Energy Efficiency Program in SoCalGas's service territory is detailed in Table VIII-1.

*Table VIII-1. Budget Summary*
*for Lodging Industry Energy Efficiency Program*
*in SoCalGas Service Territory*

| *Budget Item* | *Amount* |
|---|---|
| Administrative Budget | $72,000 |
| Marketing Budget | $72,000 |
| Direct Implementation Budget | $720,000 |
| EM&V Budget | $36,000 |
| Other Budget | $63,000 |
| **Budget Total** | $963,000 |