

*Title:*

LODGING INDUSTRY ENERGY EFFICIENCY 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:*

Lodging Industry Energy Efficiency Program  
for SCE Service Territory

Lodging Industry Energy Efficiency Program  
For SoCalGas 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

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## **I. PROGRAM OVERVIEW**

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### **I.A PROGRAM CONCEPT**

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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 Pacific Gas and Electric Company (PG&E) 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**

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Most small hotels and motels in PG&E'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.

The Lodging Industry Energy Efficiency Program uses a targeted, direct install approach through which we directly install low-flow showerheads and compact fluorescent lamps at small lodging facilities.

### **I.C PROGRAM OBJECTIVES**

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The primary objective for the Lodging Industry Energy Efficiency Program is to provide long-term gas savings by directly installing low-flow showerheads and compact fluorescent lamps in small hotels and motels that express interest in having such change-outs made. A summary of the quantitative objectives for the proposed Lodging Industry Energy Efficiency Program in PG&E'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 PG&E*

<b>Program Name</b>	Lodging Industry Energy Efficiency Program
<b>Utility Service Territory</b>	PG&E
<b>Program Type</b>	Direct Install
<b>Target Sector</b>	Lodging
<b>NR Customer Size</b>	Very small and small
<b>Performance Target</b>	18,000 CFLs installed in lodging facilities 20,000 low-flow showerheads installed in lodging facilities
<b>Annual kWh Savings Target</b>	596,160 kWh
<b>Annual Peak kW Reduction Target</b>	57.6 kW
<b>Annual Therm Savings Target</b>	334,560 therms
<b>Total Program Budget</b>	\$865,855
<b>TRC</b>	2.67
<b>PT</b>	8.63

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.

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## **II. PROGRAM PROCESS**

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### **II.A PROGRAM IMPLEMENTATION**

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Implementing the Lodging Industry Energy Efficiency Program involves (1) contacting small hotels and motels, (2) recruiting these hotels/motels to have low-flow showerheads and/or compact fluorescent lamps installed, and (3) actually installing the low-flow showerheads and CFLs. 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 showerheads and incandescent lamps.

- 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 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.
- We also demonstrate the installation of compact fluorescent lamps to replace incandescent lamps, emphasizing the use of lock-down devices to prevent the CFLs from being stolen.

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

### **II.B MARKETING PLAN**

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Owners and/or operators of lodging facilities who qualify for the program are targeted using a list of hotels and motels that we compile from industry and utility sources. The target audience is defined to be independently owned and operated lodging facilities. The list is examined to identify large hotels (having over 150 rooms) and national motel/hotel

chains, which are then removed from the list. The remaining hotels/motels are targeted for the program.

The first contact we make with the owner/manager of a small hotel or motel is a telephone contact. The majority of on-site consultations are performed from set appointments. Our schedulers call a facility and speak to the owner or operator to set an appointment at a time convenient for the decision-maker. If a scheduled appointment cancels or for some other reason cannot be performed, the field engineers attempt an unscheduled “drop-in”.

The second contact we make is a field visit to deliver energy efficiency directly to an owner or operator. We use the site visit to demonstrate the advantages of installing energy efficient equipment to the owner/operator, per the implementation procedures described in Section II.A.

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## **II.C CUSTOMER ENROLLMENT**

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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 and CFLs.

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## **II.D MATERIALS**

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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 showerhead 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

The compact fluorescent lamps that we install through the Lodging Industry Energy Efficiency Program will meet the following specifications:

- Unit shall operate between 95 and 125 VAC
- Unit shall have a standard compact screw in base designed to fit a standard lighting socket
- Threads shall have a brass coating
- Lamps shall come in 18, 20, 25, and 30 Watt models.
- Unit shall have an integral lock ring to prevent theft.
- Unit shall come with an approval from a testing agency such as Underwriters Laboratories.

We procure the compact fluorescent lamps by soliciting bids from suppliers. Candidate suppliers include the following:

- Graybar Electric
- Consolidated Electrical
- Nunn-Royal Electric
- Home Depot
- Wal-Mart
- Ace Hardware

## **II.E PAYMENT OF INCENTIVES**

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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 and CFLs directly installed at no cost to them.

## **II.F STAFF AND SUBCONTRACTOR RESPONSIBILITIES**

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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*

<i>Name</i>	<i>Title</i>	<i>Responsibilities</i>	<i>% Available</i>
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%
Mugimin Lukito	Associate - ADM Associates, Inc.	Field supervisor	15%
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 PG&E’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 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



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### **III. CUSTOMER DESCRIPTION**

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#### **III.A CUSTOMER DESCRIPTION**

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The Lodging Industry Energy Efficiency Program is targeted at owners/operators of small hotels/motels in the service territory of Pacific Gas and Electric Company. PG&E's *Commercial Building Survey Report: 1999* indicates that there are about 3,500 lodging facilities in PG&E's electric/gas or electric-only service areas, with 88 percent of these facilities having less than 50,000 square feet. Based on 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.

#### **III.B CUSTOMER ELIGIBILITY**

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Hotels/motels that are eligible for the Lodging Industry Energy Efficiency Program are generally non-chain and individually owned and operated.

#### **III.C CUSTOMER COMPLAINT RESOLUTION**

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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 PG&E'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 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**

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

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## **IV. MEASURE AND ACTIVITY DESCRIPTIONS**

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### **IV.A ENERGY SAVINGS ASSUMPTIONS**

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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.

The compact fluorescent lamps that will be installed through the Lodging Industry Energy Efficiency Program provide electric savings. Estimates for the electric savings and demand reductions from installation of a compact fluorescent lamp are available in the DEER database. However, the savings estimates that we use for compact fluorescent lamps are somewhat lower than the DEER estimates because the data collected in earlier work for SoCalGas relating to the lodging industry indicated that the number of operating hours for small hotels and motels was less than assumed for the DEER estimates.

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

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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**

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Low-flow showerheads and compact fluorescent lamps will be directly installed through the Lodging Industry Energy Efficiency Program. No rebates are made for the showerheads or for the CFLs.

### **IV.D ACTIVITIES DESCRIPTIONS**

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

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## V. GOALS

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The overall goal for the Lodging Industry Energy Efficiency Program is to deliver energy efficiency services to small lodging facilities in PG&E'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 PG&E Service Territory*

<i>Program Year</i>	<i>Numbers of CFLs</i>	<i>Electric Savings (kWh)</i>	<i>Numbers of Showerheads</i>	<i>Gas Savings (Therms)</i>
PY 2004	7,200	238,460	8,000	133,820
PY 2005	10,800	357,700	12,000	200,740
Total	18,000	596,160	20,000	334,560

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## **VI. PROGRAM EVALUATION, MEASUREMENT AND VERIFICATION**

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### **VI.A APPROACH TO PROGRAM EM&V**

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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 determine savings for low-flow showerheads:

- 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.

Types of data needed to determine savings for CFLs include the following:

- Wattage of incandescent light bulbs removed;
- Wattage of compact fluorescent lamps installed
- Number of lamps installed.
- Occupancy rate;
- Savings per compact fluorescent lamp installed;

Because compact fluorescent lamps are a standardized energy efficiency measure, we expect that deemed savings values that can be stipulated (e.g., from DEER) can be used for the installed lamps.

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;
- Average temperature of hot water;
- Number of compact fluorescent lamps installed at each hotel/motel.
- Wattage of incandescent light bulbs removed; and
- Wattage of compact fluorescent lamps installed.

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**

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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.

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## **VII. DESCRIPTION OF QUALIFICATIONS**

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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)**

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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 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

Riviera - Las Vegas, NV	Addition & Remodel
Sahara Reno - Reno, NV	Addition 200 Room, 2 story 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
Merv Griffin Residence - L.A.	Office conversion to residential 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
Inter-Community Medical Center - Covina	Off Hour CHW System, 20 Tons 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	Remodel, 3 story
Norwalk 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

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

Washington High

Westchester High

Air Conditioning Addition

Air Conditioning Upgrade

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

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 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  
 Redlands Shopping Center and Theaters  
 - Redlands  
 Riverside Shopping Center - Riverside  
 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 Campus DOC energy management system 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

**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

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

<i>Project Name / Location</i>	<i>Description of Commissioning Activities</i>
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 Figueroa	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 El-Capitan 77 <sup>th</sup> Street Police Facility Envest - GSA Holifield	Chiller system test Chiller and Ice Storage system test Complete HVAC test HVAC system, cooling tower, and CO Garage exhaust system
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**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**

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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 registered 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.

**Mugimin Lukito** is a Mechanical Engineer with 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 coordination of surveys for energy efficiency programs. Mr. Lukito is currently working on the retro-commissioning of the Arco Arena and Sacramento Airport Terminal A, sponsored by Sacramento Municipal Utility (SMUD). He was responsible for coordinating surveys for the Residential Contractor Program (RCP) evaluation sponsored by PG&E, SDG&E and SCE. Prior to joining ADM, Mr. Lukito was working as a Graduate Assistant (GA) for the University of Notre Dame Industrial Assessment Center (NDIAC) while completing his post-graduate studies. The primary goal of this program sponsored by the U.S. Department of Energy was to provide free energy, waste and productivity assessment for small to medium size local manufacturing companies. In this capacity, he was responsible for coordinating site visits, managing ongoing projects and training new staff. During his tenure at the NDIAC, he participated in more than 60 energy audits. He has also written numerous technical reports related to these assessments. Mr. Lukito earned a B.S. and M.S. in Mechanical Engineering from the University of Notre Dame.

**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 motors 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.

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## VIII. BUDGET

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

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

<i>Budget Item</i>	<i>Amount</i>
Administrative Budget	\$113,842
Marketing Budget	\$48,000
Direct Implementation Budget	\$615,000
EM&V Budget	\$32,368
Other Budget	\$56,645
<b>Budget Total</b>	<b>\$865,855</b>