



Global Energy Partners, LLC
AN EPRI, DMJM+H+N COMPANY



***Expansion of Energy Efficiency Services
For Oil Production into the PG&E Service Area***

Confirmation Number: _____

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List of all other programs proposed to CPUC:

Continuation of Energy Efficiency Services for Oil Production in the SCE Service Area
Certified Organic Farmer Energy Efficiency Program
Energy Efficiency Program for Orange County's Hard-to-Reach Agencies
Energy Efficiency Program for Food Processors in PG&E's Service Area
Energy Efficiency Program for Food Processors in SCE's Service Area

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Section I. Program Overview

Global Energy Partners, LLC (Global) and the Petroleum Technology Transfer Council (PTTC) are pleased to submit to the California Public Utilities Commission (CPUC or Commission) the following turnkey proposal to design, administer, and implement an energy efficiency program targeted toward the oil production market segment in the PG&E service area in California to achieve a peak demand reduction of 3,050 kW and energy savings totaling 21.35 GWh. This proposed Program is the expansion of a very successful 2003 program currently operating in the SCE service area.

With respect to the CPUC's primary criteria for evaluating public goods charge (PGC) Hardware and Incentive Programs, Global expects this Program to achieve the following:

- **Cost Effectiveness:** The values for the Programs' Total Resource Cost (TRC) and Participant Test (PT) are estimated as identified in the California Standard Practices Manual (SPM). The results yield the following estimates:

$$\text{TRC} = 3.20$$

$$\text{PT} = 13.50$$

Please see Section IV and the program workbook for the calculations and associated assumptions.

- **Long-term Annual Energy Savings:** Global's Program is designed to create long-term energy savings in electricity and demand reduction through a "systems approach" to the installation of more efficient pumps and motors as well as control systems for the well heads of small- to medium-sized producers in California. This type of program captures much greater savings than is possible by simply replacing components with more efficient alternatives. Global will continue to work to educate producers on the benefits of modifying their energy consumption behavior and the value of using financing alternatives to make wise energy efficient modifications. This will help sustain the intent of this Program.
- **Electric Peak Demand Savings:** Global's Program is designed to achieve a minimum of 3 MW in electric peak demand savings through the implementation of the proposed energy efficiency measures.

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- **Equity:** Global understands that the oil production industry is not necessarily *perceived* as under-served or hard-to-reach. Nonetheless, Global's relationship with its partners has allowed it to develop relationships with small- to medium-sized producers who are struggling to compete against the giant producers, especially with the current cost of a barrel of oil. The Program target market is the "Mom and Pop" producers who do not have the technical nor financial resources available to large oil producers. The Program is designed to reach out to this hard-to-reach market segment through the local representation and existing relationships of the team members. In addition, this program is in response to the needs expressed by producers in the PG&E service area requesting a companion program to the current oil program in the SCE service area.
- **Ability to Overcome Market Barriers:** The objective of this Program is to overcome market barriers to the small- and medium-sized on-shore oil producers. These barriers include high first cost, lack of consumer information about energy efficiency benefits, lack of information on available financing for energy efficiency improvements, and organizational practices that inhibit decisions. This target market is in need of program incentives to get them to implement energy conservation measures and to overcome the market barriers described above. This market is severely lacking financial and technical resources to implement energy efficiency measures. Global's Program includes incentives such as on-site energy audits with reports that cover technical and financial benefits, financing options and a plan to implement the measures. Global's ultimate goal is to have these producers understand the financial and technical benefits of modifying their energy consumption behavior as well as knowing where and how to obtain the necessary financing to get projects implemented on their own.
- **Innovation:** Global has developed a website targeted toward oil producers to provide energy saving and industry related information. Global plans to expand the development the website to promote program sustainability for interested participants. The website will contain all Program educational materials and surveys. The site provides ready access to industry information, links to energy efficiency technologies

for the target market, benchmark tools, similar utility programs, financing alternatives and best practices information.

- **Coordination with Programs Run by Other Entities:** Global plans to coordinate this Program with existing ones that address energy efficiency issues such as the California Energy Commission’s Flex Your Power, those run by other third parties, and relevant local programs. Global will also coordinate activities with the current 2003 program operating in the SCE service area. Global will explain clearly to Program participants how their participation relates to other programs. This will ensure that participants obtain full advantage of programs available to them as well as avoiding overlaps and confusion.

Global has carefully taken into account the five secondary criteria for PGC Hardware/Incentive and Information-Only/Statewide Marketing and Outreach Programs. In particular, Global expects that, through a reduction over 3.05 MW this Program will contribute to criteria (5), “Alleviates Transmission Constraints in an Area Identified by California Independent System Operator.” Specifically, this Program would contribute to a reduction of transmission constraints on Path 15.

A. Program Concept

This proposal is a natural extension of an existing program Global is implementing for the CPUC. Global is currently implementing a program designed to serve the needs of the small hard-to-reach on-shore oil producers in the SCE service area in southern California. It is this experience that makes Global’s proposal unique. Global is proposing to design and implement a non utility incentive program serving the oil production market segment in the PG&E service area in California. The specific target market is the small and medium sized on-shore oil producers that need information and incentives to reduce their energy costs. Global’s proposed program is designed to achieve long-term demand and energy savings through the implementation of the following energy efficiency measures:

- Well pumping optimization through pump-off controllers and variable frequency drives

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- Load balancing on rod pumps
- Proper sizing of water injection pumps
- Variable frequency prime movers
- Water reduction technologies like polymer injection
- Specification of premium efficient motors

Global's proposed program will focus on the adoption of a "systems approach" to optimizing motor-driven processes. This type of evaluation captures much greater savings than is possible by simply replacing components with more efficient alternatives. Global will also work to educate producers on the benefits of modifying their energy consumption behavior and the value of the use of financing alternatives to make wise energy efficient system modifications. The Global team has the experience, developed the tools, and developed the process to make this proposal a success.

B. Program Rationale

Global Energy Partners feels there is tremendous untapped opportunity to save energy in the oil production industry. The annual electric consumption for oilfield extraction is estimated to be 3700 GWH for the state of California. The CEC previously commissioned the "Optimization of Electrical Energy Consumption in Marginal California Oilfields" (CEC Study) that resulted in the development of an accurate energy auditing system to rank energy efficiency on a field or well basis. The study used the audit system to establish a database of 1,074 wells from 19 fields in California. By reviewing electric power consumption of selected fields and then developing statistical summaries, the study authors were able to identify inefficient systems. From this work, a baseline was established to identify which wells are operating above the baseline. Using this information, Global estimates that about 45% of all California wells are inefficient.

Global is currently implementing a similar program in the SCE service area. Global's program is on-track to meet its program goals and objectives. Global is currently about 67% through the timeline for the program and has applications for projects totaling 70% of the demand and energy goals. At the beginning of the Global program, a number of producers in the PG&E service area submitted applications or inquired about

participating in the program. Global program staff continues to receive inquiries from producers served by PG&E about the possible expansion into the PG&E service area. With the number of producers in the PG&E service territory exceeding those in the SCE service area by about 50%, Global feels confident that there is a need and the desire of the producers in the PG&E service area to participate in this Program. Furthermore, the expansion of the Program into the PG&E service area will build upon the experience, the tools, and the procedures developed in the current program.

C. Program Objectives

The objective of this Program is to overcome market barriers to the small - and medium - sized on-shore oil producers. Market barriers for this target market include high first cost, lack of consumer information about energy efficiency benefits, lack of information on available financing for energy efficiency improvements, and organizational practices that inhibit decisions. Global understands that the oil production industry is not necessarily perceived as an under-served market with market failures or barriers. However, Global's current program has allowed it to develop relationships with small- to medium-sized producers who are struggling to control costs and compete against the very large oil producers. This target market is in need of program incentives and assistance to implement energy conservation measures and overcome the market barriers. This market is severely lacking financial and technical resources to get energy efficiency measures implemented. Global's ultimate goal is to create long-term energy savings in electricity and demand reduction by helping producers understand the financial and technical benefits of modifying their consumption behavior as well as understanding where and how to obtain the necessary financing to implement projects. To achieve these objectives, Global will design, administer, and implement an energy efficiency program targeted toward the oil production market segment in the PG&E service area in California and realize a peak demand reduction of 3,050 kW and energy savings totaling 21.35 GWh.

Section II. Program Process

Global has put together an alliance of companies that offer the knowledge, experience and motivation to implement this Program that will result in significant energy consumption and peak demand reductions for the California oil producers.

A. Program Implementation

To implement this Program, Global will build upon the success of the current oil program. Global has developed the necessary processes, procedures, forms, and databases that can be modified for this Program. Global will develop the following program delivery strategies and mechanisms to meet the goals and objectives for the Program:

Develop Customer Recruitment and Marketing Plan

Based on Global's experience with the current program, Global will develop a plan to identify potential program participants. This plan will also address the needs and wants of the participants during the customer recruitment phase and then incorporate that information into the development of a marketing plan. Global will expand its relationships with key trade allies and equipment vendors to help identify and capture critical opportunities. This step will also include the creation of the Program tracking database to collect customer recruitment, technical and financial analysis results. See Section IIB and Section IIG, Task 2 and Task 3, for more information about customer recruitment and the marketing plan.

Develop Qualification and Survey Process

Global will build upon the process it has designed and implemented in the current program to qualify and survey participants once they have been recruited into the Program. This methodology includes the following steps: determine eligibility of customer, perform initial phone survey, qualify and prioritize the opportunities. See Section IIG, Task 4, for more information about survey and qualifying participants.

Develop Energy Auditing Process

Global will create a delivery mechanism to perform energy audits, technical, and economic analysis, of the qualified participants' opportunities. Global will work with trade allies to use state-of-the-art analysis tools to identify and diagnose well problems and develop specific solutions to these problems. See Section IIG, Task 5, for more information about energy auditing.

Develop Training and Outreach Plan

Global will develop a training and outreach plan targeted to promote ongoing interest in the Program and help insure Program sustainability. Training and outreach plays a big role in the long-term effectiveness of the energy conservation program for the producers. Global's plan will include the use of best practices and case studies to reduce producers' hesitation in installing energy efficient equipment. See Section IIG, Task 6, for more information about training and outreach.

Develop Certification and Verification Process

Global will develop the process to certify the proper installation of any recommended measures before rebates are issued to the individual participants. Rebates will be issued based on verification of savings for the successful installations. Global will also develop the process to transfer the results of the certification as well as any related data to the third party evaluator. See Section IIG, Task 7 and Task 8, for more information about certification and verification.

Develop Reporting Requirements

Global will develop reporting formats and requirements that contain information on program budgets and expenditures; projects, measures, and/or activities that were funded; the amount of energy savings and peak demand reductions associated with the program expenditures; and other information necessary to monitor compliance with Commission guidelines. See Section IIG, Task 9, for more information about reporting.

Coordination with Existing Utility Programs

Global will establish a matrix of available CEC and PG&E financing and rebate programs that would apply towards projects to be implemented under this Program.

Global will work to assure consistency between the incentive amounts available from this Program and the PG&E program to not confuse producers. Additional rebate information will be reported in the economic analysis of the project to the individual participants.

B. Marketing Plan

Global's marketing plan is designed to educate oil producers and make them aware of the available funding of energy saving measures. Global will use a variety of marketing methods to target potential program participants. These methods include direct mail, articles, E- campaigns and promotion of partner/ affiliate marketing. The collateral will make full use of the industry association, trade journals and shows as well as the internet to increase awareness and participation, and explain the financial benefits of Program participation. Global will develop specific Program collateral material that explains the benefits of the proposed approach and the savings the customer can anticipate as a direct result of implementing a comprehensive energy and demand reduction program. These marketing materials will be distributed through the industry associations such as California Independent Oil Producers' Agency, Western States Petroleum Association, Independent Oil Producers' Agency and the Conservation Committee of California Oil and Gas Producers.

C. Customer Enrollment

Global has developed a plan for recruiting customers, collecting on site characteristics, historical energy use, and customer preferences. Global will first work with the participants from the CEC Study to become program participants. This proposed Program is the perfect continuation for many participants to implement the energy saving opportunities identified during the CEC Study. Global will also identify additional potential participants by locating all producers in the PG&E service area. Global will use publicly available information to identify the oil fields in the PG&E service area and will then identify the producers within each oil field. This approach will capture the smaller

producers and will provide a complete listing of potential participants. Once potential participants have been identified, Global will establish a methodology to prioritize potential producers. The CEC Study produced a guideline for rating well energy performance. Global will use these guidelines to assist in prioritizing producers based on current well performance compared with an established baseline. The focus will be on wells with above average energy consumption compared to an established baseline. Global will then conduct an initial telephone survey with these producers to identify energy savings opportunities that meet the technical and economic analysis requirements. Global will evaluate electric power consumption loads associated with artificial lift, surface equipment, and injection pumps. The survey objectives for oil producers will focus on the following information:

- Reservoir Data - water injection levels, well depths, type of layering, oil gravity, and current production levels
- Field Data - well data and field data
 - Motor and pump survey
 - Sizing and specification diagnostics
- Was the pump size and electric motor correct for the well at the time of installation?
 - Operation and maintenance diagnostics
- Did the well produce the estimated rate?
- Did the rate change over time?
- Electric Consumption Data - Obtain 13 months of utility billing information

D. Materials

The procurement, delivery and installation of equipment will be the responsibility of the customer and the customer's vendors. It has been Global's experience that there is a wide variety of equipment that can be used to increase the efficiency of oil production. Consequently, Global does not propose to specify qualifying equipment. Instead, Global will utilize the energy auditing process to identify, diagnose, and recommend corrective actions to assure that potential projects and equipment produce energy savings for the producer and the utility. Global will work with producer staff to prioritize potential

projects and assist in the development of projects that meet the producer's internal financial criteria.

E. Payment of Incentives

Global's proposed Incentive Payment Structure is based on our experience with the current program. Global will provide incentives for qualifying projects for participants on a first-come first-served basis. Global's experience has been that a 50/50 cost sharing program for energy conservation measures have worked very well. Under Global's current program, the incentive for motor, drives, and controls is \$0.08 per annual kWh. For all other measures the incentive is \$0.05 per annual kWh. Global's experience has been that in most cases the actual incentive is less than these amounts because of the 50% cost sharing requirement. Additionally, no single program facility, nor participant, shall receive more than 20% of the total funds allocated from the Commission to the program administrator. Global estimates the average equipment and installation cost to be \$11,200 per well for projects involving motors, controls, and drives. This will result in an estimated maximum incentive payment of \$5,600 per well. Global estimates the average equipment and installation cost to be \$7,000 per well for projects involving other energy efficiency measures. This will result in an estimated maximum incentive payment of \$3,500 per well. Global will be responsible for the certification of the proper installation of any recommended measure before a rebate is issued.

F. Staff and Subcontractor Responsibilities

Global Energy Partners will be the Prime Contractor and Program Administrator for the proposed Program. Global will be directly involved in each task. The following provides an outline of the relationship between the Team and the corresponding areas of responsibility.

Mr. Mark Reedy will act as the Program Manager interfacing directly with the PG&E Program Manager and maintaining overall responsibility for the Program and all of its components. Mr. Reedy and the Global team will be directly responsible for the development of the Program definition, the development of the marketing and customer

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recruitment plan. Mr. Russ Goold of Global will assist in the necessary research and coordination of information and will be performing the survey and qualification of participants. Mr. Reedy will be responsible for managing and coordinating the energy audits as well as the performance and review of the technical and economic analysis. Mr. Reedy will also be responsible for the ongoing program management and quarterly reporting.

The Petroleum Technology Transfer Council (PTTC) (See Section VIIB) will act as technical resource for the project and will provide assistance in the following areas:

- Performing economic analysis
- Market analysis and strategic planning
- On-site customer assistance for training and outreach program

The EPRI-PEAC (See Section VIIB) will act as technical resource for the project and will provide assistance in the following areas:

- Performing product/technology research and analysis
- Market analysis and strategic planning

Independent Oil Troubleshooters (See Section VIIB) are independent oil industry experts that will provide assistance in the following areas:

- Performing energy audits, training, troubleshooting
- Certification

Ershaghi Consulting (See Section VIIB) will provide website and Customer Relationship Management (CRM) database support.

G. Work Plan and Timeline for Program Implementation

Global's approach to this Program is very straightforward. Global will use the experience and industry contacts that it has developed implementing a similar program in California to identify, recruit, and qualify potential program participants. Global will then work with the customers' vendors or with the local trade allies to identify

economical energy savings projects. Global will then work with the program participants to remove barriers that prevent the installation of these energy savings projects. Finally, Global will certify and verify the project installation and energy savings. Our proposed statement of work calls for completing a total of nine tasks listed below:

- Task 1: Define Program
- Task 2: Develop Marketing Plan
- Task 3: Develop Customer Recruitment Plan
- Task 4: Survey and Qualify Participants
- Task 5: Provide Energy Audits/ Economic Analysis
- Task 6: Conduct Training and Outreach
- Task 7: Certify Installations
- Task 8: Verify Savings
- Task 9: Provide Ongoing Program Management and Reporting

Our approach to the tasks is detailed in the sections that follow.

Task 1: Define Program

This task is to develop the guidelines and parameters by which this Program will be operated. To that end, Global will define the Program objectives, develop a detailed project workplan, conduct a project kickoff meeting, and develop an inception report based on these activities. The project kickoff meeting will be held within two weeks of award of the contract.

Task 2: Develop Marketing Plan

This task is to develop a marketing plan to educate oil producers to make them aware of the funding of energy saving measures available. Global has developed relationships with a number of industry organizations and will use these contacts to distribute marketing materials. Marketing materials will be made available through industry associations such as California Independent Oil Producers' Agency, Western States Petroleum Association, and the Independent Oil Producers' Agency.

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Global will use a variety of marketing methods to identify potential program participants. These methods include direct mail, articles, E- campaigns and promotion of partner/ affiliate marketing. Global will also use trade journals and industry trade shows as well as the internet to increase awareness and participation, and to explain the financial benefits of program participation.

Global will also build off of the success of the current California program and utilize its website at www.cutopex.com to provide information to oil producers. Global's website is currently experiencing an average of 1,700 hits per month. The website is a valuable tool for producers to get Program information and to obtain other industry related information. Global will expand the website to include the PG&E program and will take advantage of the existing data and information for use by the California oil producers. Below is a screen shot of the first page of the website:

Screen Shot of Cutopex Website

CUTOPEX
CUT OPERATING EXPENSES

Home About Press Releases Vendors Step by Step Application

Search

Related PTTC Workshops:

- Power Cost Reduction in Oilfield Operations
- Managing Oilfield Operations under Adverse Economics
- Energy Crisis and Solutions for California Oilfield Producers
- California Oilfield Electric Consumption Survey
- Diagnosis and Design of Sucker Rod Pumping Systems
- Monitoring and Reducing Operating Cost of Pumping Wells
- Effective Ways to Cut Operating Expenses

CUTOPEX
CUT OPERATING EXPENSES

A rebate program sponsored by the California Public Utilities Commission.

Energy Efficiency Services for Electricity Consumption and Demand Reduction in Oil Production in the State of California

This rebate program provides the opportunity for qualified producers to optimize their pumping units, reduce electric consumption and obtain up to 50% of the investment cost. Qualified small to medium size California producers are invited to submit application for this rebate program as soon as possible.

Program Description:

The proposed program is a non-utility incentive program serving the non-residential process overhaul market segment in the Southern California region, specifically Los Angeles, Long Beach, Ventura and Bakersfield service territories of the investor-owned utilities under the CPUC's jurisdiction. The specific target market is small and medium sized on-shore oil producers in need of information and incentives to reduce their energy costs. The energy efficiency measures will include the following measures:

- Well pumping optimization through pump-off controllers and variable frequency drives
- Load balancing on rod pumps
- Proper sizing of water injection pumps
- Variable frequency prime movers
- Optimization of fluid cooling systems
- Specification of premium efficient motors

Press Releases Program Description Participating Vendors Results of the CFC/EPRI

Last Updated: 8/15/2003 Contact Calendar Resources Reports Study Results FAQ

Task 3: Develop Customer Recruitment Plan

Global will develop a plan for recruiting customers, collecting data on site characteristics, historical energy use, and customer preferences and maintaining positive relationships with the customers participating in this effort. An existing Customer Relationship Management (CRM) Database will be expanded and used to collect, store, and sort the information obtained during the Program.

Global will identify all of the producers in the PG&E service area. Global's research into California oil production has shown that there are large oil fields in the PG&E service area. The prime fields are in the area between Bakersfield and Coalinga. Global will be focusing its recruitment efforts on producers in the counties of Fresno, Kern, Kings, Monterey, San Benito, San Luis Obispo, Santa Barbara, and Tulare. Global will use the results of the CEC Study to identify those producers with above average energy consumption. Global will also work with the Petroleum Technology Transfer Council (PTTC) to target the producers that are likely to require assistance or have known operating problem. Global's research has also shown that excessive water production may be a problem with these producers and that potential solutions may yield substantial energy and demand savings. For some producers, the cost of pumping and injecting water can be over 50% of the electric bill. Combining the results of these efforts will result in a list of potential program participants.

Global has had great success in the current California program with a simple 3-step approach to customer recruitment:

- 1) Initial phone contact to develop relationship and determine interest
- 2) E-mail follow-up with educational packet explaining the detail of the Program and the benefits to the participants
- 3) Phone follow-up to set up a phone survey with the appropriate person

Global will use this process to contact the potential program participants to encourage them to participate in the Program and to work with Global to identify energy savings projects.

Task 4: Survey and Qualify Participants

Global has designed and implemented a methodology to qualify and survey participants once they have been recruited into the Program. This methodology includes the following steps: perform initial phone survey, qualify and prioritize the opportunities. Once an eligible customer qualifies for the Program the site visit for the energy audit is scheduled. The steps are outlined in more detail below.

1) Conduct Initial Phone Survey

The initial survey to qualify a customer will be performed over the phone. It may be necessary to perform the survey on site to gather the necessary data. The purpose of the survey is to identify if the customer has adequate technical and financial opportunities for savings to meet the Program criteria. The initial survey will focus on obtaining the following information:

- Field data to pre-qualify participant for an energy audit
- Thirteen months of electric bills or written permission and account number from producer to obtain information directly from utility
- Determination of whether participant is willing to cost share
- Determination of the technical and financial considerations of the producer what retrofits or modifications they will consider and what financial hurdles they have to meet, such as simple payback
- Determination of whether participant will be obtaining additional project funding
- Most recent four quarters of production data

2) Qualify and prioritize opportunities

Once a customer has been surveyed, the results of the survey will be reviewed and the opportunities will be qualified and prioritized. The qualification process is defined as follows:

- The survey data is entered into the database and analyzed to determine which of the wells qualifies for the Program.

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- The results of the survey will determine the potential savings of the well.
- A portion of this initial data also provides the basis for the establishment of the well baseline energy consumption and demand conditions for future Program evaluation.
- Once this is accomplished the wells are prioritized for further evaluation and the results are reported to the producer. The report will include a Letter of Understanding for the producer's signature to assure their commitment to move forward in the Program once the opportunities are identified and meet the established technical and financial considerations of the owner.

Global has included a step to eliminate potential double dipping by program participants into more than one ratepayer- or taxpayer-funded public purpose programs. The risk of abuse can be minimized through careful participant tracking and coordination among programs. Customers accepting financial incentives through any program approved by the CPUC will be required to acknowledge the source of funds by signing an affidavit or other paperwork declaring that they have received no funds for the same activity from another program or source along with the Letter of Understanding.

Once the opportunity has been qualified and prioritized, the next step is to schedule an on-site visit for the energy audit once the Letter of Understanding has been signed by the producer.

Task 5: Provide Energy Audits/ Economic Analysis

Global has designed a delivery mechanism to perform energy audits, which include technical and economic analysis, of the qualified participants' opportunities. The energy audits for oil producers will focus on the assessment of all motors and pumps, specifically identifying those running below peak efficiencies.

Global's Program focus is on the adoption of a "systems approach" to optimizing motor-driven processes. This type of evaluation captures much greater savings than is possible by simply replacing components with more efficient alternatives. Although doing so may

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have merit, a systems approach, which includes better matching of components (motors, pumps, blowers, fans, compressors, drives, etc.), appropriate application of variable speed drives and appropriate matching of operational regimens and system performance to loads, provides a far greater degree of savings.

Global will take a multi-tiered approach to working in each field. First, Global will collaborate with its trade allies to let technical experts work with field managers and operators to identify and capture critical opportunities. These are situations where equipment routinely fails or causes severe maintenance problems. Both situations are indications of opportunities for producers to further optimize their systems and, in most cases, capture significant additional energy savings.

The technology to support best practices for pumps and motors is readily available. Global's objective is to remove the barriers that are preventing widespread adoption of these practices. Global will work with the trade allies to use state-of-the-art analysis tools and controls and provide field training on these systems when appropriate.

The following is an outline of data collected during the energy audit:

- Reservoir Data - water injection levels, well depths, type of layering, oil gravity, and current production levels
- Field Data - well data and field data
- Motor and pump survey
- Sizing and specification diagnostics
- Was the pump size and electric motor correct for the well at the time of installation?
- Operation and maintenance diagnostics
- Did the well produce the estimated rate?
- Did the rate change over time?
- Where more complex problems exist, metering and measurement equipment may be used.

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The interpretation of data collected during the audit will begin with the energy utilization analysis of historical electrical consumption and demand information and then focus on evaluation of eligible measures under the Program. The following is an initial list of eligible measures for this energy saving and demand reduction program:

- Well pumping optimization through pump-off controllers and variable frequency drives
- Load balancing on rod pumps
- Proper sizing of water injection pumps
- Variable frequency prime movers
- Optimization of fluid cooling systems
- Specification of premium efficient motors

Once the technical analysis has been completed the economic analysis will be performed. Global will perform the economic analyses including cash flows and simple paybacks. Global will also provide a summary of financing alternatives for the specified solutions. The goal of this measure will be to educate the producers on alternative ways to continue investing in financially and technically sound energy efficiency projects, even without the utility rebates.

Global will provide a plan of action in the form of a report to the producer that will outline the steps the participants need to take in order to install the measures identified at their site with the specific program procedures for installation, and potential financing options. The following items will be included in the report for the customer:

- Project description
- Estimated project installation cost
- Equipment specifications and available vendors
- Estimated energy savings resulting from project
- Cost effectiveness analysis

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- Cash flow
- Guidelines for available financing
- Steps needed to be taken to implement the project and obtain the rebate, which includes recommended vendors and contractors

The results will then be reviewed to assure the reported solutions meet the technical and financial criteria. Global will then contact the producer with report results and will discuss implementation, funding and schedule. This will include presentations to senior management to achieve Program buy-in on an as-needed basis.

Task 6: Conduct Training and Outreach

Global will also provide training and outreach to participants to promote ongoing interest in the Program and help assure Program sustainability. Training and outreach plays a big role in determining the long-term effectiveness of the energy conservation program for the producers. The following outlines Global's strategy for an innovative training and outreach program.

The technology to support best practices for pumps and motors is readily available. Global will work to remove the barriers that are preventing widespread adoption of these practices. Global will provide "In The Field Training" by working with oilfield personnel to perform analysis and provide training on the use of the software and reporting template. Global will also educate operators in the basics of energy efficiency in the oil field through the distribution of a "Best Practices" publication. This will help to identify oilfield personnel as the "energy management champion". The key to a truly successful energy management program is having on site staff involved in the development of the Program and helping to increase their capabilities. Global will also work with producer staff to provide presentations to senior management to achieve buy-in into the Program.

Global will also conduct two workshops for training and outreach purposes. Over the course of the project, six (6) workshops are to be held. The first set of workshops will focus on outreach and sharing the Program progress and getting participants involved.

The second set of workshops will focus on actual project results to encourage producers that have not participated in the Program to gain information and remove barriers to the use of energy savings technologies and encourage investment in energy efficient systems. The last set of workshops will consist of a Program wrap-up to present the results of the Program and provide training to promote Program sustainability. Each workshop will last one half-day, with invitations sent to oil producers in the identified PG&E service area.

Task 7: Certify Installations

The project installation cost must be approved by Global before the work can begin to ensure the project estimated cost and actual costs are within a reasonable range. Global will be responsible for the certification of the proper installation of any recommended measure before a rebate is issued. The rebate will be issued based on verification of actual savings and Global's receipt of invoice funds from the PG&E contract manager.

Task 8: Verify Savings

As part of the requirements of this Program, Global will develop monitoring and verification procedures to properly track the activities of the customers as a result of the initial assessment.

The process for measurement and verification (M&V) of the project results begins with the development of the EM&V plan during in the early stages of the Program development. Global's EM&V procedures include the following:

- Audit of existing operating conditions before any change of operation or installation of any equipment or software is performed
- Baseline measurement of energy use, duty cycling and process flow production rates
- Verification of the installation of the energy saving equipment and/or software
- Post- installation measurement of energy use, duty cycling and process flow production rates

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- Follow-up measurement of energy use, duty cycle and process flow production rates 12 months after installation.

The following is a summary of information that will be collected for each measure installed for any given location:

- Measure description
- Physical location of measure
- Utility account number of the account serving the impacted facility
- Annual baseline energy usage (kWh) of affected system
- Annual post-installation energy usage (kWh) of affected system
- Summer season baseline coincident peak (kW) demand of affected system
- Summer season post-installation baseline coincident peak (kW) demand of affected system
- Incremental cost of measure
- Useful life of installed measure

Task 9: Provide Ongoing Program Management and Reporting

This task will encompass all strategic, budgetary, program administration, and reporting elements of this Program. The Program Manager will provide strategic direction to the project team with regard to goals, timelines, expected results, and other general planning factors through:

- Develop and update quarterly a project plan showing all tasks, team members' roles and deliverables, budget requirements, and timelines
- Institute quality control procedures and frequently check progress with respect to deliverable schedule and quality
- Be the key interface with the PG&E program manager, and provide monthly updates regarding progress

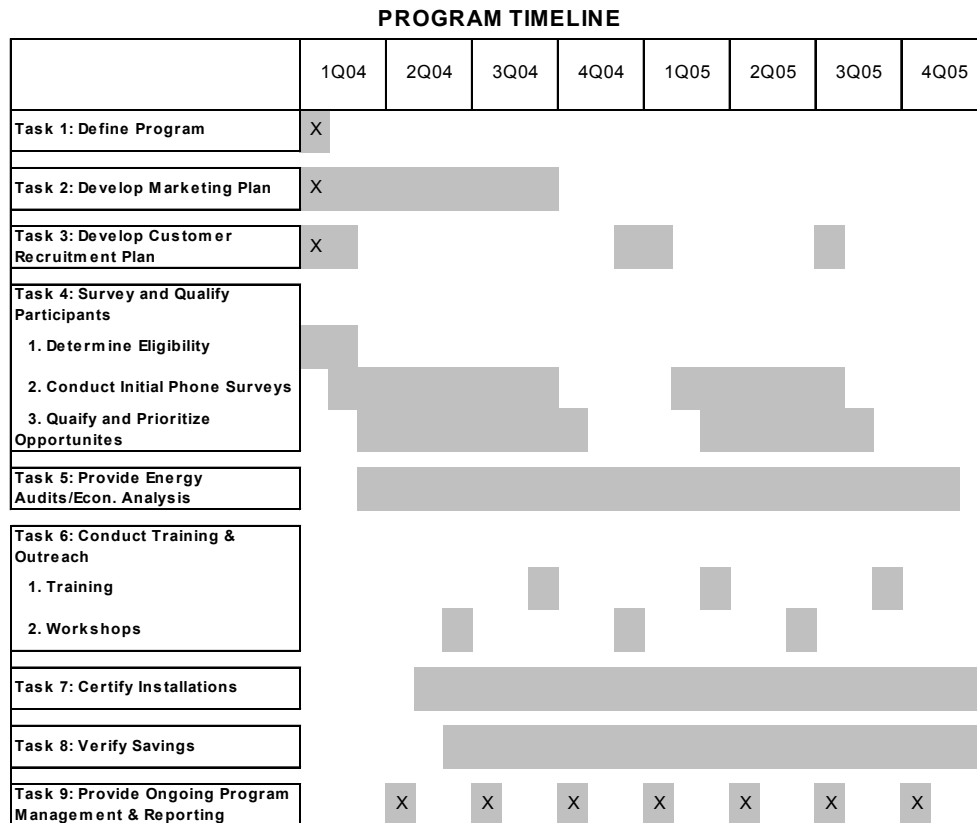
Budget management will be handled by the Program Manager to assure the prudent expenditure of funds, and that such expenditures are in line with technical progress and within the limits set in the project plan. Program administration functions, such as day-to-day coordination of project team member activities, contracting, personnel matters, and

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invoicing will be handled by the Program Manager. The project plan developed at the beginning of the Program is a road map that will be used to guide the project team. As with every project, the plan is modified as the project proceeds to address any requirements that are not clearly identified at the start of the project. The project team will monitor Program progress through status reports and weekly team meetings and discussions. This approach facilitates the resolution of issues and ensures that implementation efforts are conforming to the plans outlined in the planning documents.

Timeline

The proposed Program is designed for a two-year period beginning on January 1, 2004 and concluding December 31, 2005. Global Energy Partners is experienced in successfully managing projects on schedule and within budget requirements. The following task schedule is proposed based on a contract signature date of December 15, 2003:



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The following schedule of deliverables is proposed:

Deliverable 1—Marketing Plan:	January 31, 2004
Deliverable 2—Customer Recruitment Plan:	January 31, 2004
Deliverable 3—Quarterly Status Reports (11):	Starting 15th of April, 2004

Section III. Customer Description

A. Customer Description

The proposed Program will be targeted at small to medium on-shore oil producers.

B. Customer Eligibility

Program participants must be a small to medium on-shore oil producer in the PG&E service area with an average daily production equal to or less than 20,000 barrels per day. The average daily production will be determined based on the previous year's production data and calculating the average daily production.

C. Customer Complaint Resolution

All customers will have access to the Global Program Manager phone number, email address and fax number to contact Global with any questions or concerns. Global will do its best to resolve any disputes. If there is a situation that Global is having difficulty resolving, Global will contact the assigned PG&E contract manager to discuss alternatives to resolve the producers concerns.

D. Geographic Area

The proposed Program will be targeted toward the oil producers located in the PG&E service area in California. The Program will be open to all mid to small on-shore oil producers in the PG&E service area. Global will concentrate its recruitment and marketing efforts towards producers in the counties of Fresno, Kern, Kings, Monterey, San Benito, San Luis Obispo, Santa Barbara, and Tulare.

Section IV. Measure and Activity Descriptions

Global's experience is that the measures listed below are most often used to increase the energy efficiency of oil production. It is also Global's experience that producers will utilize a combination of these technologies depending on an analysis of the well performance. For the purposes of calculating the total costs and benefits of these measures in the workbook, these measures are grouped together and treated as an average.

- Well pumping optimization through pump-off controllers and variable frequency drives
- Load balancing on rod pumps
- Proper sizing of water injection pumps
- Variable frequency prime movers
- Water reduction technologies like polymer injection
- Specification of premium efficient motors

A. Energy Savings Assumptions

The CEC Study established an estimated demand savings of 11 kW per well. The study assumed that all wells may be improved to reduce lifting consumption to 0.5 kWh per barrel of fluid per 1000 feet of well depth. Power consumption savings and demand reduction savings were calculated for all wells exceeding the nominal lifting consumption. These values were totaled for all fields resulting in a potential power consumption reduction of 11 kW per well. Global's actual experience has been that each well will implement a different combination of measures. Under Global's current program, the average well energy savings is about 70,000 kWh per year and the average well demand reduction is 9.85 kW. Global is grouping the individual measures together and using an estimated average demand savings of 10 kW per well. The combination of Global's actual practice and analytical research provides a reliable estimate of the measure impacts.

Most of the equipment used in oil production operates around the clock. For the purposes of estimating energy savings, Global is using a conservative estimate of 7000 hours per year of operation or 80% of the available hours.

B. Deviations in Standard Cost-effectiveness Values

Net to Gross Ratio (NTGR): Global is using a net-to-gross ratio of 1.00 for this Program. The NTGR ratio accounts for program free riders that would have undertaken a measure or project, regardless of any energy efficiency program promoting the measure. In Global's experience administering an identical program in the SCE service area, participants would not have considered or installed energy efficient improvements without the program.

Effective Useful Life (EUL): The EUL for a Process Overhaul is 20 years. However, the EUL is 15 years for high efficiency motors, variable frequency drives, pump test and system controls. For this proposed Program, Global is using a EUL of 15 years to maintain a conservative estimate.

Incremental Measure Cost (IMC): Global's experience is that producers usually bundle projects together that may include the replacement of equipment that is needed to maintain the operation of the well and measures that may be eligible for an incentive. Based on Global's experience, the estimated average incremental measure cost is \$11,200 for projects involving motors, controls, and drives and \$7,000 for projects involving other measures.

C. Rebate Amounts

Global proposes to provide rebate amounts based on the annual energy savings of the project. Global will provide incentives for qualifying projects for participants on a first-come first-served basis. Global's experience has been that 50/50 cost sharing for energy conservation measures has worked very well. Under Global's current program, the incentive for motor, drives, and controls is \$0.08 per kWh. For all other measures the incentive is \$0.05 per kWh. Global's experience has been that in most cases the actual incentive is less than these amounts because of the 50% cost sharing requirement.

D. Activities Descriptions

The proposed Program implementation plan includes activities that are not directly expected to produce measurable energy savings but that are critical to the success of the Program. The activities include energy audits, customer outreach and training, installation certification, and EM&V activities. While these activities do not directly result in energy savings, the proposed Program will not achieve the proposed goals without these activities.

Section V. Goals

The performance goals shown below are based on engineering and experience implementing a similar program in the SCE service area. The goals are based on affecting 305 wells during the Program.

Goal	2004	2005
Customer Recruitment (wells)	3,500	2,600
Survey/Qualification (wells)	350	260
Energy Audits (wells)	175	130
Certify Installations (wells)	175	130
Demand Savings (kW)	1,750	1,300
Energy Savings (kWh)	12,250,000	9,100,000

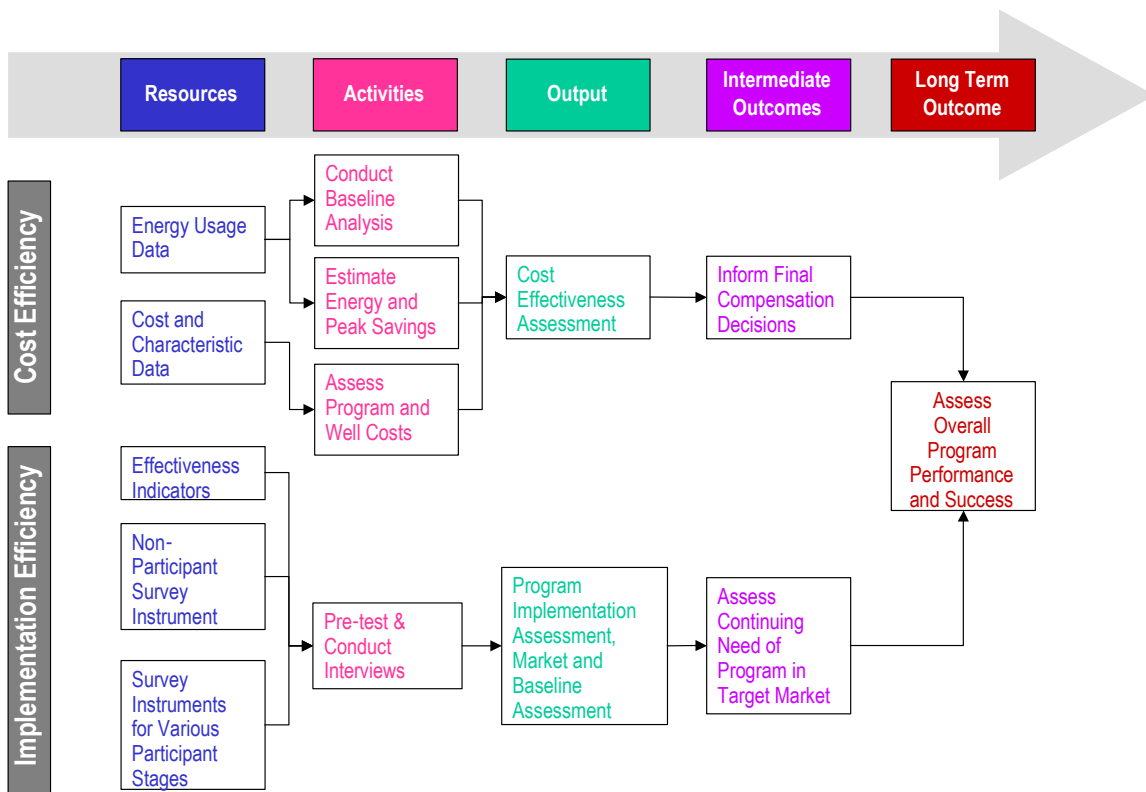
The actual number of wells participating in the Program and the actual savings per well will vary depending on the exact retrofit implemented. Global has used conservative numbers for the purpose of the determining the performance goals and the evaluation of the Program's cost effectiveness.

Section VI. Program Evaluation, Measurement and Verification (EM&V)

The primary goal of the EM&V effort is to provide an assessment of the level of performance and success of the proposed Program. Performance will be achieved through two activity areas: cost efficiency and implementation efficiency. Global's proposed methodology is based on the EM&V workplan for its current program. The diagram

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shown below describes the relationships among program evaluation elements and shows how the various pieces – resources, activities, output, intermediate outcomes, and long-term outcomes – fit together. The EM&V effort is in accordance with the requirements contained in the CPUC Energy Efficiency Policy Manual, Version 2 and consistent with the guidelines in the International Performance Measurement and Verification Protocol (IPM&VP). The figure below includes the requirements outlined in Section 6 of the Manual.



For the cost efficiency analysis, the EM&V contractor will conduct tasks such as the following:

- 1) Evaluate Methodology of Calculating Energy Savings. Conduct an initial review, or audit, of Global's energy savings estimation methodology.
- 2) Provide Interim Energy Savings Estimates for Participants. Once a critical mass of participant's data has been collected, the EM&V contractor will review Global's energy savings calculations, according to Option B of the International Performance

Measurement and Verification Protocol (IPMVP) Manual. Global anticipates that data from five to ten participants will be a sufficient to conduct this review.

- 3) **Conduct Cost-Effectiveness Analysis.** At the end of the Program, the EM&V contractor will determine the Program's cost effectiveness using the relevant tests outlined in the Energy Efficiency Policy Manual, Version 2.
- 4) On a monthly and quarterly basis, coordinated with Global's reporting schedule, the EM&V contractor will provide memos documenting progress and findings to date. The EM&V contractor will report overall findings in a final report delivered at the end of the evaluation.

To complete these tasks, the EM&V contractor will use the following resources:

- Energy Usage Data. Energy usage data will be provided by Global and will include pre- and post-implementation operating conditions, energy, and demand usage for each participating well.
- Well Characteristic Data. Well characteristic data will be provided by Global and will include:
 - o Verification, description, and location of installed energy-saving equipment
 - o Any impact on production capabilities (if available)
- Cost Data. Global will provide the following cost data:
 - o Costs associated with measures
 - o Program administration costs
 - o Any costs paid by the well owner
- Utility Avoided Cost Data. To conduct the cost-effectiveness analysis, the EM&V contractor will obtain avoided costs for PG&E. If this information is not readily available, the EM&V contractor can use general avoided costs from the workbook.
- Load Shapes. The EM&V contractor will obtain load shapes for oil well pumping to conduct the cost-effectiveness analysis. Global will conduct short-term, pre - and post load measurements. The EM&V contractor will determine through interviews with the producers how the load is likely to vary with time, if at all, and incorporate these variations in the cost-effectiveness analysis to account for temporal variations in avoided costs.

To complete these tasks, the EM&V contractor will conduct the following activities:

- Conduct Baseline Analysis. Baselines will be created for all participant wells, using the pre-implementation operating conditions, demand, and energy usage for each. These data will be collected and provided by Global. To the extent possible, the EM&V contractor will also create baselines for representative groups using secondary data sources or aggregating data for subsets of participants, such as those within specified production rate ranges.
- Estimate Level of Energy and Peak Demand Savings Achieved. The EM&V contractor will review Global's calculation methodologies and relevant data. The EM&V contractor will also review the appropriateness of the methodologies. This review can be conducted prior to the estimation of the first participant's savings if Global has set up these processes. Based on the data provided by Global, the EM&V contractor will estimate the energy savings and peak demand impact of the Program in accordance with CPUC mandates. Utilizing the baseline and post-installation data collected from power measurements, dynamometers, and flow meters, the EM&V contractor will estimate the energy savings achieved by the installation of energy-efficiency measures. Depending on the degree of data manipulation, it may be necessary for the EM&V contractor to use a sampling approach to determine energy impacts.

For the implementation efficiency analysis, the EM&V contractor will conduct tasks such as the following:

- Design Surveys. The EM&V contractor will design surveys for participants and non-participants.
- Conduct First Half of Surveys. During the second quarter of 2004, the EM&V contractor will survey 15 oil producers with an attempt at an even distribution of the groups mentioned above. Given the hard-to-reach nature of these customers, the EM&V contractor may interview several key industry stakeholders such as vendors and industry representatives.

Expansion of Energy Efficiency Services for Oil Production into the PG&E Service Area

- Write Memo of Findings. After conducting the first half of the interviews, the EM&V contractor will write a memo on the preliminary findings. This memo will contain preliminary recommendations for implementation improvement.
- Conduct Remaining Surveys. During the fourth quarter of 2004, the EM&V contractor will survey 15 more oil producers and, if useful, other stakeholders.
- Report on Findings. On a monthly and quarterly basis, coordinated with Global's reporting schedule, the EM&V contractor will provide memos documenting the implementation efficiency progress and findings to date. The EM&V contractor will report overall findings in a final report delivered at the end of the evaluation.

To complete these tasks, the EM&V contractor will develop the following tools:

- Effectiveness Indicators. Before designing survey instruments, the EM&V contractor will create indicators of effectiveness that can be utilized in both participant and non-participant surveys, including satisfaction with marketing materials, recruiting process, and rebate levels. Specifically, the EM&V contractor will design the surveys so that they indicate whether the target market will participate in the Program in the future and which incentives were the primary motivators for participation.
- Non-Participant Survey Instrument. The EM&V contractor will work with Global to design a survey instrument for oil producers who were informed about the Program, but who either have not yet chosen to participate or have decided to not participate. The EM&V contractor will obtain a list from Global of organizations that were targeted in the customer recruitment process. The survey instrument will include topics such as:
 - o How they heard about the Program
 - o What were the more and less effective areas of the recruiting process
 - o How they assessed the initial and final workshops (if attended)
 - o Which Program features interested them
 - o Whether they have chosen to not participate or are still undecided and why
 - o What level and type of incentive would have led them to participate or would be likely to lead them to future participation

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- o What energy efficiency measures they have implemented since hearing about the Program and, if any, whether the decision to do so was influenced by the Program
- o What equipment they had prior to hearing about the Program
- o Any suggestions they may have for Program improvement
- Participant Survey Instrument. The EM&V contractor will design a survey instrument for Program participants to understand their satisfaction with both the process and the installed energy-efficiency products. The EM&V contractor will ask questions such as:
 - o How they heard about the Program
 - o What were the more and less effective areas of the recruiting process
 - o How they assessed the initial and final workshops (if attended)
 - o Which Program features interested them
 - o What ultimately made them decide to participate
 - o Whether they implemented any other energy efficiency measures since hearing about the Program
 - o What energy efficiency measures they had before installing the equipment
 - o How satisfied are they with the installed equipment
 - o Do they have any suggestions for Program improvement
- Measure Installation Confirmation. As part of the participant interviews, the EM&V contractor will ask what measures were installed under the Program and confirm that those stated are the same ones in the documentation provided by Global.
- Other Stakeholders. The EM&V contractor will design an interview guide for various other stakeholders, such as Program vendors and industry representatives. It will be important to interview representatives of these groups because of the likely difficulty of completing interviews with a representative sample of oil producers and the ability of these groups to provide information about baseline energy-efficiency practices and measures in the oil production industry. Global proposes that these interviews address broad issues that oil producers face and possible barriers to Program participation.

To complete these tasks, the EM&V contractor will conduct a series of interviews. Interviewees will be selected from lists provided by Global and other industry sources. The EM&V contractor will select a random sample of non-participants for these interviews. The EM&V contractor will conduct interviews via phone whenever possible, but email submission will be accepted if that is their preference. The EM&V contractor will conduct 30 interviews of producers – half in the second quarter of 2004 and the remainder in the fourth quarter of 2004. The EM&V contractor may also interview approximately five other stakeholders.

Potential EM&V Contractors

Quantec Consulting

6229 SE Milwaukie Avenue

Portland, Oregon 97202

Quantec is the approved EM&V subcontractor for Global’s current CPUC non-utility program.

Nexant, Inc.

101 Second Street, 11th Floor

San Francisco, California 94105-3672

Nexant provided EM&V services to the California Energy Commission (CEC) Peak Load Reduction Program. Nexant also performed EM&V work on many of the CEC program elements funded under AB970, SB5X and AB29X.

Section VII. Qualifications

A. Primary Implementer

Headquartered in Lafayette, California, with affiliate offices nationwide, Global combines the forces of two of the nation’s leading energy organizations—the Electric Power Research Institute (EPRI) and DMJM H+N. Known throughout the world as cutting-edge science and technology consortia, EPRI has partnered with DMJM H+N to

play a major role in the energy industry. In addition, Global recently acquired the NEOS Corporation, a California-based consulting firm with over 17 years' experience and a recognized leader in the development and application of energy-related strategies and technologies.

EPRI brings world-class expertise in energy efficiency technology research and development, utility system operations, technology applications analysis, cost benefit/economic analyses, and market transformation studies. DMJM H+N, one of the world's premier engineering management and construction companies, adds critical expertise in managing major public and private energy-related programs. Global provides in-depth project management, program design, development, administration, and performance assessment experience. Combining these exceptional capabilities with experience related to large energy-efficiency projects and in the commercialization of energy technology, results in an integrated team of unparalleled capabilities.

Over the past 17 years the Global team has attained an international reputation for its work in the energy efficiency, renewable energy and distributed generation fields. Global employs professionals trained in engineering, economics, planning, environmental science, computer science, business administration, marketing, and physical and social sciences.

A thorough understanding of both public and private sector operations enables Global to focus on workable solutions and implementation. This means not merely studying a client's problems, but offering innovative and technically sound solutions, and assistance in implementing those solutions. Global brings a fresh approach to the restructured energy industry – an approach that focuses on overcoming market barriers and making efficient technology attractive to energy users. Global has extensive expertise in the following areas:

- Managing and administrating programs
- Developing strategic and tactical marketing and management plans
- Transforming the energy marketplace

Expansion of Energy Efficiency Services for Oil Production into the PG&E Service Area

- Performing quality engineering and economic analyses
- Solving large energy consumers’ challenges
- Minimizing environmental impacts of energy use
- Supporting energy education and training
- Providing technical regulatory assistance

Global has a proven, long-term track record of successful management, implementation and administration of large energy related programs. The following is a brief synopsis of the most relevant projects for this proposal.

GLOBAL ENERGY PARTNERS, LLC – PROJECT SUMMARIES

Energy Efficiency Study Category	Client Name Name of Study Timeframe	Project Description
Program Management and Implementation	California Public Utilities Commission Energy Efficiency Program for Oil Producers in Southern California (2002 - present)	<p>Global was selected by the California Public Utilities Commission to manage a rebate program targeted toward small to medium size onshore producers who are willing to optimize their pumping equipment and reduce electric consumption. The incentive program covers up to half of the investment required to make corrective actions. Global’s team of field specialists is helping interested producers reduce their electricity consumption and lower their operation expenses. Global is estimating that at least 100 wells may qualify for this rebate program. The program is targeting energy efficiency measures including:</p> <ul style="list-style-type: none"> • Well pumping optimization through pump-off controllers • Load balancing on rod pumps • Proper sizing of water injection pumps • Variable frequency prime movers <p>Global’s program is designed to achieve a minimum of 1.76 MW in electric peak demand savings through the implementation of these energy efficiency measures</p>

GLOBAL ENERGY PARTNERS, LLC – PROJECT SUMMARIES

Energy Efficiency Study Category	Client Name Name of Study Timeframe	Project Description
Demand Response Program and Evaluation Assessment	California Energy Commission Peak Load Reduction Program (2001 - 2002)	Global implemented and evaluated a program throughout the state of California that delivered demand curtailments in response to curtailment calls initiated by the state’s electrical grid authority. Global developed the program around its Power-pact brand name and associated website www.power-pact.com . The program addressed strategies that reduce power demand attributable to air conditioners, lights, motors and other electrical loads from commercial, manufacturing and state/local government facilities. Measurement and verification of savings was accomplished through the assessment of online utility meter data, and engineering simulation models were run to validate the demand-response impacts. An automated notification platform was developed using web-based applications and telecommunication devices that activated both voluntary and automatic curtailments during peak demand periods. Global’s system also provided pricing signals to customers in support of the State’s pilot real-time pricing program. The program was funded through a grant from the California Energy Commission per Assembly Bill 970 and Senate Bill 5X.
Project Administration and Operation	San Diego Regional Energy Office (SDREO) Demand Reduction Program (2002 - 2003)	Under subcontract, global supported the implementation of SDREO’s 2002 energy management program for the California energy commission. In support of SDREO’s 8 mw demand reduction goal, Global’s responsibilities included marketing and customer recruitment, engineering analysis, it infrastructure development, customer hardware and software, equipment design and installation, customer training, testing and verification, and ongoing support.

GLOBAL ENERGY PARTNERS, LLC – PROJECT SUMMARIES

Energy Efficiency Study Category	Client Name Name of Study Timeframe	Project Description
Project Administration and Operation	California Independent System Operator (ISO) Demand Reduction Initiative (2001)	Global served as a load reduction aggregator for the California ISO in their Demand Relief Program (DRP) for Summer 2001. Global reserved 15 MW of demand relief for the DRP, relying on three major customer bases in the commercial, industrial, and institutional sectors. Global established itself as a load aggregator under the auspices of the CEC demand response program. Since many of the customers participating in the CEC program were also interested in receiving financial incentives in exchange for their voluntary curtailments, their inclusion in the ISO DRP program was a natural extension of the overall demand relief initiatives in California during 2001.
Energy Auditing	Department of Energy (DOE) Federal Energy Management Program (FEMP) (2000 – present)	Global was selected by the Department of Energy (DOE) to work with Federal Agencies to identify cost-effective energy efficiency, water conservation, and renewable energy measures that could be undertaken and developed into projects. Global provides SAVEnergy survey services in four of the six DOE regions and has provided these services to a variety of different federal agencies. Under the SAVEnergy program, Global provides comprehensive building energy surveys, water conservation surveys, renewable energy screening, and analyses of other specific energy consuming systems such as HVAC, lighting, heat pumps, motors, and boilers. Global also provides energy engineering and economic analysis, identification of energy conservation measures (ECM's), life cycle cost analysis, and project cost estimating of recommended ECM's.

GLOBAL ENERGY PARTNERS, LLC – PROJECT SUMMARIES

Energy Efficiency Study Category	Client Name Name of Study Timeframe	Project Description
Potential Assessment	Alliant Energy/Interstate Power & Light (IPL) IPL Energy Efficiency Plan Filing (2002 - present)	Global prepared a long-range energy efficiency plan for the IPL subsidiary of Alliant Energy as part of their regulatory requirements for the Iowa Utilities Board (IUB). The project involved developing estimates of long-term energy efficiency program savings for all customer segments, including residential, commercial, industrial and agricultural. Savings potential forecasts included technical, economic and achievable for these customer segments. Included in the assessment was a detailed specification of the program designs, a comprehensive cost-effectiveness analysis, and generation of savings goals and programmatic budgets. Project support currently entails regulatory tasks related to completion of data requests from the IUB and the various intervenor groups, as well as expert testimony by principal Global staff.
Integrated Resource Plan	Great River Energy Assessment of Energy and Capacity Savings Potential (2003 - present)	Global is conducting a comprehensive assessment of energy efficiency potential for this generation and transmission cooperative utility serving most of rural Minnesota. In addition, Global's economic analysis will provide direct input to Great River's integrated resource plan that it is filing with the Minnesota Department of Commerce. The assessment also includes development of avoided capacity and energy costs, using various production costing models.

GLOBAL ENERGY PARTNERS, LLC – PROJECT SUMMARIES

Energy Efficiency Study Category	Client Name Name of Study Timeframe	Project Description
Program Review and Benchmarking	Alliant Energy/ Wisconsin Power & Light Company (WPL) WPL Shared Savings Program Review (2002 - present)	Global conducted a review of Alliant Energy’s Wisconsin Shared Savings program. The program provided commercial, industrial and agricultural customers with a turnkey performance contracting service. Customers enjoyed the benefits of energy saving investments with the proceeds of the savings used to pay back the capital cost of the investments. In the review, Global conducted a benchmarking assessment, comparing Alliant’s program efforts to similar offerings from utilities around the country. In addition, Global conducted an economic analysis of the program using cost-effectiveness software tools. The project culminated in the development and delivery of expert testimony by Global principal staff during the November 2002 rate hearings before the Wisconsin Public Service Commission.
Energy Efficiency Potential	Hawaiian Electric Company (representing the 3 investor-owned utilities in Hawaii) Assessment of Energy Efficiency Potential (2003 - present)	Global is conducting an assessment of energy efficiency and demand response resource potential for Hawaii. The assessment is a prelude for integrated resource plans (IRP) that will be developed by each of the utilities per regulatory requirements.

GLOBAL ENERGY PARTNERS, LLC – PROJECT SUMMARIES

Energy Efficiency Study Category	Client Name Name of Study Timeframe	Project Description
Program Assessment	CALMAC Summary Study of California 2001 Energy Efficiency Programs (2002 - 2003)	Global conducted an assessment of the program impacts, budgets, cost effectiveness and savings persistence across all programs offered by various entities within California during the program year 2001. The Summary Study was funded by the California Measurement Advisory Council (CALMAC). Broad-based and comprehensive, it covers all programs funded by various sources during the 2001 program year, including the public goods charge, AB 970 and SB 1 5X.
Technology Assessment and Screening	Iowa’s Investor-Owned Utilities (Alliant, UtiliCorp, MidAmerican, United Cities Gas) Assessment of Energy and Capacity Savings Potential in Iowa (2001 - 2002)	Global conducted this collaborative study in order to enable each of the four sponsoring utilities to have the necessary foundation that would allow for them to develop individual energy efficiency plans, consistent with each company’s goals and objectives. The assessment involved analysis of over 400 energy efficiency measures, spanning the residential, commercial and industrial sectors. The assessment had three primary objectives: <ul style="list-style-type: none"> • Development of base case assessments and end-use characteristics for a variety of market segments, drawing upon a combination of data provided by the utilities and high-quality secondary data sources. • Assessments of energy-efficient technologies including measure identification, screening and impact development, drawing from the vast pool of secondary public information. • Assessments of selected energy-efficient technologies that replace the primary energy source (either from gas to electric or from electric to gas).

GLOBAL ENERGY PARTNERS, LLC – PROJECT SUMMARIES

Energy Efficiency Study Category	Client Name Name of Study Timeframe	Project Description
Potential Assessment	State of Illinois Benefits and Implications of Residential Energy Efficiency Programs (2001)	Global identified potential energy efficiency improvements that can reduce electricity consumption for Illinois residential customers and estimated the potential benefits and costs of implementing state programs to bring about such improvements. This work was in preparation for the expected public benefits programs that will be implemented in Illinois as a result of electricity deregulation in that state. The project involved a benchmark assessment of prior experiences, an economic analysis of the potential benefits resulting from the programs, and suggested program designs that will result in the most efficient delivery to the consumer markets.
Program Marketing and Management	Electric Power Research Institute Technology Application Centers (2001 - present)	Global manages, operates and provides technical direction for seven key EPRI end-use technology application centers throughout the United States. They are: <ol style="list-style-type: none"> 1) Healthcare 2) Manufacturing Industries 3) Agriculture and Food Technology Alliance 4) Municipal and Industrial Water & Wastewater 5) Process Industries 6) Commercial and Residential Markets 7) Market-Driven Demand Response

GLOBAL ENERGY PARTNERS, LLC – PROJECT SUMMARIES

Energy Efficiency Study Category	Client Name Name of Study Timeframe	Project Description
Assessment of Program Delivery	Sempra Energy Solutions Segmentation Studies and Market Planning (1997-98)	Global supported Sempra on various market transformation studies that helped shape the marketing strategies for this new energy service company. The studies focused on assessing market and customer-specific data on energy consumption, customer needs and issues, and decision-making processes. Work also involved the development of pricing and risk management strategies. Global also developed a software tool for Sempra that simplified the application of the DOE-2 engineering simulation model. The tool is being used to assess the cost-feasibility of various energy efficiency products and services.
Potential Study	State of Hawaii DSM Resource Assessment (1995)	Global completed a project for the Department of Business, Economic Development and Tourism (DBEDT) to develop a DSM resource assessment model for each of the islands in Hawaii. The DSM resource model was linked to the State of Hawaii's energy forecasting mode, ENERGY 2020. As part of the model development work, Global staff performed DOE-2 building simulation modeling to determine typical building energy use and DSM measure impacts in the residential and commercial sectors of the State. This information, along with DSM impact information developed outside of DOE-2 modeling, was part of the DSM database that is accessed by the DSM resource assessment model.

B. Subcontractors

Petroleum Technology Transfer Council. The Petroleum Technology Transfer Council (PTTC) was formed in 1994 by the U.S. oil and natural gas exploration and production (E&P) industry to identify and transfer upstream technologies to domestic producers.

PTTC's technology programs help producers reduce costs, improve operating efficiency,

increase ultimate recovery, enhance environmental compliance, and add new reserves. PTTC is an industry-directed, regionally-focused not-for-profit organization with programs that meet the technology needs of its primary customers-independent producers. Independents face technology decisions every day, such as whether to address an opportunity or problem with technology, what solution to use, whether it is cost effective, and how to use it. In serving as the independent producer's "Bridge to Solutions," PTTC fulfills three roles:

- First, it helps identify and clarify producers' problems and makes them aware of technology opportunities.
- Second, it educates producers about technology options.
- Third, it connects producers to these solutions.

Through its 10 regions, PTTC offers expert assistance, information resources, interdisciplinary referrals, and demonstrations of E&P software. Technology workshops, currently well above 100 per year, cover the full spectrum of PTTC's five program lines: (1) exploration, (2) drilling and completion, (3) development and reservoir, (4) operations and production, and (5) environmental issues. National and regional newsletters provide technology alerts, case studies, and other information. Databases and other important local information are available in each region.

Although PTTC does not perform or fund research and development (R&D) projects, it identifies producers' technical problems and communicates them to the R&D community. PTTC also provides valuable services to another important market segment-technology solution providers-by making them more aware of the needs of independent oil and gas producers. This group includes service and supply companies, vendors, technical consultants, government R&D programs, national labs, academia, professional societies, and others. Serving as a technology intermediary, PTTC delivers value to both groups: (1) Solution providers benefit when PTTC educates producers about their technologies and how to access them. (2) Producers benefit when PTTC helps solution providers understand the technical problems of independents.

The PTTC will act as technical resource for the project and will provide assistance in the following areas:

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- Performing economic analysis
- Market analysis and strategic planning
- On-site customer assistance for training and outreach program

Oilfield Trouble Shooters. The Oil Trouble Shooters will act as technical resources for the project and will provide assistance in the following areas:

- Performing energy audits, training, troubleshooting, and
- Certification

Global has existing relationships with some oil trouble shooters who are providing these services in the current program. The Oil trouble shooters are:

- Richard D. Finken is a licensed Petroleum engineer in the state of California. He is a consultant with broad experience ranging from field operations to being an expert in reserve determination and project economic analysis. Richard has a record of successful production optimization study and implementation programs in the oil fields. He has extensive experience in field operations analysis and improvement programs. Mr. Finken acted as the Team leader for the PTTC electrical consumption reduction program.
- Jeevan P. Anand has over 24 years of oil and gas industry experience starting from development of underground storage fields as an engineer, to managing multi-disciplinary teams involved in pipeline installations, drilling of oil and gas wells, and managing of urban oil and gas facilities. Mr. Anand has hands-on experience in virtually all aspects of oil and gas operations. He is a certified Petroleum Engineer in California and a team member of the PTTC electrical consumption reduction program.
- Herman E. Schaller received his Bachelor of Science and Master of Science in Petroleum Engineering from the University of Southern California. Herman has been Petroleum Engineering Consultant since 1983. Mr. Schaller's have included being a Field Engineer with the Conservation Committee of California Oil

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Producers, a Petroleum Engineer with the Texas Company, an Area Sales Manager with Eastman Oil Well Survey Co. and a Vice-President and Marketing Manager for Triangle Service Company. He is a Member of SPE, API, and SPWLA. Herman was a team member of the PTTC electrical consumption reduction program.

EPRI PEAC Corp. EPRI PEAC Corp. offers power quality expertise in industrial processes, wiring and grounding, electromagnetic interference, electronic lighting, semiconductor manufacturing, healthcare facilities, computer modeling, and electric load simulation. The center collaborates with the groups that set performance standards for electronics manufacturers and has influenced those standards to improve immunity to power quality problems. EPRI PEAC Corp. also participates in the Institute of Electrical and Electronic Engineers and industry groups such as the National Electrical Manufacturers Association.

The center employs 20 technicians and engineers, with wide-ranging areas of special expertise, and seven administrative and support staff members. It also draws on a nationwide network of expert consultants.

EPRI-PEAC will act as technical resource for the project and will provide assistance in the following areas:

- Performing product/technology research and analysis
- Market analysis and strategic planning

Ershaghi Consulting. Ershaghi Consulting is a minority owned small business focused on database development, website design, and training. Ershaghi Consulting will provide website and Customer Relationship Management (CRM) database support.

C. Resumes or Description of Experience

Mark Reedy. Mr. Reedy is a Senior Associate with Global and has over 23 years of electric utility experience in areas such as planning, customer service, rates, marketing, and energy efficiency programs. He provides experienced project management for assignments involving site surveys, program implementation, rate analysis, rate design, program design, distributed generation, energy conservation measure analysis, building analysis and engineering modeling, and privatization studies.

Mr. Reedy is currently Global's project manager for the California Public Utilities Commission's energy efficiency program targeted toward small hard-to-reach oil producers in southern California. In addition, Mr. Reedy is the project manager for DOE's Federal Energy Management Program (FEMP) SAVEnergy energy audit program and was the operations manager for Global's demand response program for the California Energy Commission. Prior to joining Global, Mr. Reedy was the Manager of rates and regulatory affairs for Plains Electric Generation and Transmission Cooperative where he supervised a multi-functional team to develop revenue requirements, cost-of-service studies, rate designs, and testimony associated with rate case filings. For fifteen years, Mr. Reedy held positions of increasing responsibility at Wisconsin Electric Power Company where he implemented a \$60 million per year energy efficiency program utilizing 350 utility and contractor staff, developed innovative business plans, designed electric rates, and prepared economic analyses.

Mr. Reedy earned a B.S. in electrical engineering from the University of Colorado and is a registered Professional Engineer (P.E.) in Wisconsin.

Bettina Foster. Ms. Foster is a Senior Associate with Global Energy Partners. Her focus is on strategic planning, program marketing, administration and implementation. Bettina has over eighteen years of experience in commercial, industrial and healthcare energy projects. She has been involved in all phases of project implementation from initial analysis and concept design to marketing, construction, metering and monitoring.

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Currently, Ms. Foster is the project coordinator for the California Public Utilities Commission's Energy Efficiency Services for Electricity Consumption and Demand Reduction in Oil Production in the State of California. Responsibilities include overseeing the development of program materials, customer recruitment, site audits, reporting, commissioning and verification of the retrofit installations. Bettina is also coordinating the efforts of numerous subcontractors to reach program goals. Previously, Ms. Foster worked on demand response programs for the California Energy Commission and the San Diego Regional Energy Office. She was responsible for development of program marketing materials, customer recruitment, and coordination of the many aspects of these programs.

Before joining Global, Bettina worked as the Director of Business Development of the West Coast for TXU Energy Services and before that as a National Account Manager for ServiceMaster Energy Services. Other projects include project management and engineering services for oil refineries and high tech industries including construction management, titanium refining and ultrasound applications. She has also performed technical support work, including cost estimating and materials procurement for cogeneration, rail, and other heavy industry construction projects.

Ms. Foster holds a B.S. in Mechanical Engineering from the University of Colorado in Boulder.

Patricia Hurtado. Ms. Hurtado is Vice President at Global Energy Partners, where manages the firm's technical staff. She manages and conducts program design, implementation, and performance assessment; strategic planning; market evaluation; energy efficiency measure analysis; building analysis and engineering modeling; distribution and retail sector analysis; and privatization evaluation studies for the firm's utility clients.

Prior to joining Global and NEOS, Ms. Hurtado was an independent consultant in South America for three years where she was project manager for studies to restructure the

energy distribution sectors of several public utilities, evaluate the technical and economic potential of privatization, and design privatization procedures for electric utilities. Ms. Hurtado was an associate with Barakat & Chamberlin for four years where she provided demand-side management analysis, utility resource and strategic planning, forecasting, and rate design and analysis for the firm's utility clients.

Ms. Hurtado earned an M.S. in Mechanical Engineering from Stanford University and a B.S. in Mechanical Engineering from the University of Los Andes in Bogotá, Colombia. She is a registered Professional Engineer (P.E.) in California.

Russell Goold. Mr. Goold is an Analyst with Global Energy Partners. Mr. Goold's current projects include managing customer relations for the California Public Utilities Commission's energy efficiency services program for California oil producers. Working closely to recruit customers and initiate participation, Mr. Goold collaborates with participants to identify energy efficiency improvement projects and determine eligibility for rebates. For this project, his duties include initial site assessments, contract preparation, resolution of metering and other technical requirements, and maintenance of the customer database.

Mr. Goold's past project experience includes managing customer relations for demand response programs, conducting project research on green power in deregulated states, analyzing energy quality needs in wastewater treatment and air cargo carriers, and tracking state and federal legislation pertaining to distributed generation.

Prior to joining Global, Mr. Goold worked as an analyst with the California Integrated Waste Management Board in its Targeted Implementation Assistance group. Working directly with jurisdictions under Board-mandated compliance, Mr. Goold negotiated and managed work plans designed to improve jurisdiction performance, incorporate new solid waste prevention programs, and educate the public on solid waste reduction efforts.

Mr. Goold holds a B.S. in Environmental Policy Analysis and Planning, with an emphasis in Energy, from the University of California at Davis.

Ingrid Bran. A Senior Associate with Global Energy Partners, Ms. Bran has over fourteen years of experience in the energy sector and conducts analyses that focus on technical and economic aspects of the industry. She brings expertise in the areas of load research, end-use data analysis, sampling and surveys, economic analysis, and market research. She has recently been involved in the management of projects to provide an assessment of the role of demand-side management (DSM) on greenhouse gas emissions, to implement load reduction programs for California, and creating a five-year R&D plan for the California electronics industry.

Prior to joining Global, Ms. Bran worked for over eight years at EPRI in several management capacities. Her most recent responsibilities involved managing client relations, technology transfer and customer service in Spain, the Caribbean, and Latin America. At EPRI she also was Manager of R&D Planning and Analysis for the Customer Systems Group, preparing and presenting strategic R&D forecasts for short-, medium-, and long-term horizons in consultation with client utility advisors.

Ingrid worked during four years at Southern California Edison (SCE) developing, analyzing, and reporting load research data in support of rate, regulatory, conservation/load management, system planning, and regulatory requirement activities. She created computer programs to access, validate, and statistically analyze electricity data and authored analytical reports on various electricity customer groups and programs including real-time pricing. Ms. Bran was also a Senior Analyst in economic consulting at Micronomics, Inc., and Market Planning and Research Analyst, and International Economist at Union Bank.

Ms. Bran holds a Bachelor's degree in Economics from California State University, Fullerton, and a Master's degree in Economics from the University of California, Berkeley.

Neil Podkowsky. Mr. Podkowsky is an Analyst with Global Energy Partners, providing quantitative support and research assistance on energy privatization studies, demand relief programs, utility market restructuring, and building energy use simulation. In addition, he is experienced with conducting commercial and industrial building energy audits and assessing energy conservation measures for audited sites.

At Global, Mr. Podkowsky has provided technical, engineering, and analytical support for the California Energy Commission's Demand Response Program implementation. The project involved extensive DOE-2 building simulations, meter data analysis, rate schedule analysis, and demand relief calculation. He has performed rate schedule and demand response impact analyses for EPRI's Real-Time Pricing Study. This included simulation of demand reduction strategies under different pricing schemes for a variety of commercial facilities throughout California. He assisted in the quantitative evaluation of Alliant Energy's Demand Side Management Programs including determinations of program impact, feasibility, and potential. Mr. Podkowsky has also led audit teams, analyzed energy conservation measures, and composed energy audit reports for various federal government facilities for the Federal Energy Management Program (FEMP).

Prior to joining GEP, Mr. Podkowsky was a project analyst for Cannondale Associates, providing quantitative and qualitative marketing support to a variety of Fortune 100 clients.

Mr. Podkowsky holds a B.A. in Economics from Washington University in St. Louis.

Section VIII. Budget

Below is a summary of the project budget from the associated workbook.

Budget Category	Total	Percentage of Total Budget
Administrative		
Managerial and Clerical Labor	\$705,150	22.18%
Human Resource Support and Development	\$0	0.00%
Travel and Conference Fees	\$55,553	1.75%
Overhead (General and Administrative) - Labor and Materials	\$70,998	2.23%
<i>Total Administrative Costs</i>	\$831,701	26.17%
Marketing/Advertising/Outreach	\$147,090	4.63%
Direct Implementation		
Financial Incentives to Customers	\$1,386,700	43.63%
Activity - Labor	\$453,105	14.25%
Installation and Service - Labor	\$0	0.00%
Hardware and Materials - Installation and Other DI Activity	\$0	0.00%
Rebate Processing and Inspection - Labor and Materials	\$117,900	3.71%
<i>Total Direct Implementation</i>	\$1,957,705	61.59%
Evaluation, Measurement and Verification	\$146,992	4.62%
Financing Costs	\$95,185	2.99%
Total Budget	\$3,178,673	