April 27, 2010

Ms. Marilyn Lyon
Program Manager
South Bay Cities Council of Governments
South Bay Environmental Services Center
15901 Hawthorne Blvd., Suite 400
Lawndale, CA 90260

Subject: South Bay Partnership Technical Support Services Proposal (REVISED)

Dear Ms. Lyon:

Per your request, AESC is pleased to submit this revised letter proposal to provide technical support services to the South Bay Partnership, in support of the Southern California Edison (SCE) and Southern California Gas Company (SCG) Local Government Partnership Program, 2010 – 2012 Program Period. In this effort, AESC will provide technical support services involving energy project identification, comprehensive and targeted energy audits, calculation and incentive application assistance, building commissioning and general technical support. Our technical support team also includes Portland Energy Conservation, Inc. (PECI) as a subcontractor, who will provide additional expertise in building commissioning and technical training.

The following scope-of-work describes the proposed technical support effort (Tasks 1 – 6). Please note that our contractual relationship with SCE and SCG precludes us from assisting SCE and SCG customers in projects where AESC may have a financial interest in the outcome. Therefore, this proposal assumes that the work will be conducted under a time and material arrangement. Also, it is our understanding that SCE and SCG will only reimburse SBESC for energy project related expenses, so our proposed scope-of-work is limited to energy support tasks.

## Task 1. Technical Support Activities Coordination & Project Management

*This task will involve meeting with South Bay Environmental Services Center (SBESC) program manager and key personnel to establish coordination of technical support activities related to Tasks 2 – 7 below. AESC will also participate in weekly status meetings to report on progress of project completion. With input from SBESC, a standard reporting format will be established. If necessary AESC will perform routine job walks and follow-ups to ensure that project activities are progressing towards completion. We anticipate during these weekly meetings a discussion of additional service requests will likely occur. At the direction of SBESC, AESC will be available to present project findings to utility customers, authorized customer agents and governing boards.*

### Task 2. Identify Candidate Energy Projects

*Under this task, AESC will collect and assess existing energy audit reports, energy evaluation studies and other related documentation and determine its validity and applicability to current conditions at each facility. After the screening process is complete, AESC will establish a prioritized list of candidate projects from the information that is deemed acceptable. When needed, we will identify necessary additional data to finalize energy analysis and provide recommendations on how to best accomplish this work.*

### Task 3. Comprehensive and Targeted Energy Audits

*If the South Bay Partnership wishes to investigate other energy opportunities outside of what has been established in Task 2, AESC will provide the following energy audit services for other facilities:*

- *Provide technical audit services for facilities and processes serving the governmental customer segment.*
- *Identify energy efficiency, demand response, and renewable energy opportunities.*
- *Provide a detailed inventory of a facilities' equipment and energy savings and recommendations, incentives, life cycle costs and other evaluation analysis.*

### Task 4. Calculation and Incentive Application Assistance

*Under this task, AESC will provide detailed calculations and information needed for incentive application. For energy projects identified in Tasks 2 and 3, AESC will work closely with SBESC and the utility customer and their authorized agent to produce defensible calculations and supporting assumption documentation.*

### Task 5. Energy Efficiency Building Commissioning for Existing Buildings

*Under this task, the technical support team will perform building commissioning for existing buildings (EBCx). PECI will be the technical lead on this effort. PECI will utilize a systematic process for investigating, analyzing and optimizing the performance of building systems. They will lead selected projects through each phase of the EBCx process: screening, investigation, measure selection, implementation, verification and operator training.*

### Task 6. General Technical Support Services

*Under this task, AESC will provide general technical support services including, but not limited to, the following activities:*

- *Answer energy related technical questions similar to a "help desk" process.*
- *Short-term and long-term end-use energy and environmental conditions monitoring and reporting*
- *Develop and execute measurement and verification plans*
- *Conduct site inspections*
- *Perform building energy computer simulation*
- *Perform cost and measure lifetime analysis*
- *Generate reports and presentation material*

### Estimated Budget

We propose to perform the SOW described above on a time and material basis with the following not-to-exceed annual budget of $ $96,574 per year (SCE $74,980 + SCG $21,594) covering the 2010-2012 program period. If any of the proposed tasks are not required by

SBESC, then the associated budgets can be shifted to the other tasks if so desired. Due to different billing rates for AESC and PECI, two budget tables were developed.

### Tasks 1, 2, 3, 4, & 6 (AESC Estimated Costs)

| | AESC Fully Burdened Labor Rate $/hr => | $165 | $146 | $129 | $119 | $108 | $87 | $72 | $65 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Task | Task Description | Principal | Program Manager | Sr. Engineer | Staff Engineer | Engineer | Assoc. Engineer | Engr. Assistant | Administrator | Labor Hrs Subtotal | Labor Subtotal | Travel Subtotal | ODCs | Subtotal |
| 1 | *Project Management & Coordination* | 16 | 24 | | | | | | 10 | 50 | $6,794 | $300 | $0 | $7,094 |
| 2 | *Identify Candidate Energy Projects* | 8 | 24 | 24 | 56 | 52 | | | | 164 | $20,200 | $0 | $0 | $20,200 |
| 3 | *Comprehensive and Targeted Energy Audits* | | 16 | 24 | 48 | 48 | | | | 136 | $16,328 | $0 | $0 | $16,328 |
| 4 | *Calculation and Incentive Application Assistance* | | 8 | 24 | | 56 | | | | 88 | $10,312 | $0 | $0 | $10,312 |
| 5 | *Energy Efficiency Building Commissioning for Existing Buildings* | | | | | | | | | | | | | |
| 6 | *General Technical Support Services* | | 16 | 24 | 40 | 32 | | | | 112 | $13,648 | $0 | $0 | $13,648 |
| | | | | | | | | | | | | | **Total =** | **$67,582** |

### Task 5 (PECI Estimated Costs)

| | PECI Fully Burdened Labor Rate $/hr => | | | $150 | | $120 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Task | Task Description | Principal | Program Manager | Sr. Engineer | Staff Engineer | Engineer | Assoc. Engineer | Engr. Assistant | Administrator | Labor Hrs Total | Labor Total | Travel Total | ODCs | Total |
| 5 | *Energy Efficiency Building Commissioning for Existing Buildings* | | | 132 | | 108 | | | | 240 | $28,692 | $300 | $0 | $28,992 |

## Labor Rates

The tables below summarize AESC's and PECI's proposed hourly labor rate for this effort.

## *AESC Hourly Rates*

| Staffing Direct Labor | Responsibility | Proposed Hourly Rate ($) |
|---|---|---|
| Principal Engineer | Provides overall management, expert utility technical consulting and advanced engineering analysis for multiple projects, programs and technical teams. Interfaces with utility customers, contractors and regulatory personnel. Typically has more than 20 years of experience. | $165/hr |
| Program Manager | Provides program and utility management of multiple projects and teams typically within a single program. Coordinates technical analysis, stakeholder issues and provides program design consulting. | $146/hr |
| Senior Engineer | Provides utility technical expertise, program and engineering analysis for multiple projects. May manage small teams of technical staff to provide utility program and engineering support. Typically has more than 7 years of experience. | $129/hr |
| Staff Engineer | Provides utility technical expertise, program and engineering analysis for assigned projects. Typically has at least 5 years of experience. | $119/hr |
| Engineer | Provides fundamental engineering analysis for multiple projects. Assists in field work planning and data collection, data analysis and monitoring. Has at least 3 years of experience. | $108/hr |

| Staffing<br>Direct Labor | Responsibility | Proposed Hourly Rate<br>($) |
|---|---|---|
| Associate Engineer | Provides fundamental engineering analysis for assigned projects. Assists in field work including data collection and monitoring. Has up to 3 to 4 years of experience. | $87/hr |
| Engineering Assistant | Provides technical assistance to engineering staff including but not limited to data collection, data entry, results reporting, technical research, etc. | $72/hr |
| Administrator | Provides administrative support including report publishing, data entry and data management. | $65/hr |

## *PECI Hourly Rates*

| Staff | Rates ($/hr) |
|---|---|
| | 2011 |
| **Lia Webster**<br>Senior Engineer | $155 |
| **Dave Moser**<br>Senior Engineer | $155 |
| **Mark Effinger**<br>Engineer | $125 |
| **Matt Tyler**<br>Engineer | $125 |

## Qualifications and Project Personnel

AESC is well suited to perform the technical support services for the South Bay Partnership. AESC has been selected to be a contractor providing support to SCE's and SCG's Local Governments Partnership Program.

Greg Stevens, a Program Manager at AESC, will lead the technical support effort. Ron Ishii, Principal Engineer, will assist Greg by providing occasional technical and management guidance. Also assisting Greg and Ron will be staff from both AESC's Carlsbad and Pasadena offices. Corporate capabilities for each team member and resumes for all AESC project personnel are enclosed with this letter proposal.

If you have any questions please contact me at (760) 931-2641 x112.

Sincerely,

Ronald K. Ishii, P.E.
President

## AESC Corporate Capabilities

AESC is an engineering and management consulting firm that provides services to utility and energy markets. AESC has very solid technical experience with energy efficiency, demand reduction and renewable energy systems. Since its inception in 1994, AESC has provided technical services to the California Investor Owned Utilities in support of commercial, industrial, institutional and agricultural energy efficiency programs, as well as the Self-Generation Incentive Program and California Solar Incentive program. These services have included program management support, as well as program implementation services such as application & energy savings review, measurement & verification, customer facility audits, building and process energy system modeling, equipment field inspections, performance testing, customer application assistance, and customer and account representative training. Additionally, statewide AESC services include the engineering review of energy saving calculations, short and long term monitoring, evaluation of new technologies, development of measure performance monitoring and work paper development.

AESC has a long history of working with SCE and its customers; identifying energy efficiency opportunities, analyzing the technical and economic feasibility of energy projects, developing and reviewing supporting engineering savings calculations and utilizing building and process models to forecast end-use equipment performance.

AESC has an extensive set of internal engineering tools & information sources to assist in comprehensive audits, work paper development/review, engineering consulting, fieldwork and making manufacturing processes more efficient.

The following AESC owned hardware is available for use in support of the selected task groups.

Computer Equipment – Each employee is supplied with a personal computer (Pentium based) running Windows XP operating system. All employee PCs are networked to a Server (XEON 2 GHz based) running Windows 2000 Small Business Server software and four ancillary servers for file sharing/warehousing and application deployment. All servers are protected from data loss utilizing a RAID5 hard drive controller and a tape backup system (daily backups).

Monitoring and Safety Equipment – Power measurement instruments (e.g. PowerSite 250), data loggers (e.g. Campbell Scientific, Extech and HOBO H8). Safety equipment for all field personnel are hardhats, personal protection equipment, eye protection, digital camera and first aid kits.

Software – eQuest, EZ Sim (billing analysis tool), AIRMaster+, Chilled Water System Analysis Tool (CWSAT), Fan System Assessment Tool (FSAT), MotorMaster+, Process Heating Assessment, MiniTAB statistical analysis tool and Survey Tool (PHAST), Pumping System Assessment Tool (PSAT).

## PECI Corporate Capabilities

PECI focus' on innovation and practical solutions makes us a pioneer and formidable force in the energy efficiency arena. Our programs deliver results, and we continually improve our processes to overcome new energy efficiency challenges. PECI has developed and delivered innovative energy efficiency projects, programs and research for utilities, government and the private sector for nearly three decades. Our history of technical assistance for institutions across the U.S. ranges from program design and implementation to facility diagnostics and measure analysis. Founded on the guiding principle of responsible energy use, PECI has grown from a handful of committed individuals in 1980 to more than 300 industry professionals, researchers and technicians today – with a deep commitment to creating and supporting the new energy economy.

They are nationally respected for delivering innovative program designs and market-transforming program implementation. Our portfolio includes research, projects and programs in more than 20 states and Canada, all of which have resulted in billions of kWh, therm, and gallon savings over time. In

California, we have and continue to manage large retrocommissioning projects and programs for the major utilities, including performance tracking through existing building automation systems.

The backbone of PECI's success is their ability to identify and implement opportunities that result in improvements in energy efficiency, and in the highest achievable energy and cost savings. We work collaboratively with clients to develop strategic tools and methods to serve their needs, bringing years of experience and problem solving to bear on each program decision. Their projects and programs achieve energy efficiency, educate customers and enhance acceptance of energy efficiency practices, resulting in long-term persistent of savings.

## AESC Resumes

### *Ronald K. Ishii, P.E.*

Mr. Ishii is President and a Principal Engineer for Alternative Energy Systems Consulting. He has over 29 years of consulting experience in C&I energy efficiency and on-site power generation technologies for utilities, energy technology developers and large energy users. Mr. Ishii joined AESC shortly after its incorporation in 1994.

Besides managing AESC wide operations, Mr. Ishii currently leads several efforts at AESC. These include; CSI & SGIP technical & policy support for the California IOUs, management of the development of the CSI EPBB calculator and CSI trigger websites, P.E. review of SPC/IEEP verification and management of the RCx pre-calculated development effort.

Previously, Mr. Ishii managed several investment grade energy audits; design and development of the 1999 Small Business Standard Performance Contract (SBSPC) program for California's investor owned utilities including the development of energy savings estimation tool as well as the measurement and verification (M&V) protocol for motors and boilers; and energy savings verification of over 200 energy efficiency measures installed in SCE's service territory as part of the Measurement and Evaluation of the Energy Management Hardware Rebate Program.

Prior to joining AESC, Mr. Ishii was a Program Manager in the Advanced Energy Systems Division of Science Applications International Corporation (SAIC). Mr. Ishii was responsible for technical service to electric and gas utilities as well as the California Energy Commission, EPRI and GRI performing work on fuel cell testing, gas cooling technologies, thermal energy storage, advanced refrigeration systems, industrial electrotechnologies, residential heat storage, emission controls, and distributed generation technologies.

Prior to joining SAIC, Mr. Ishii was employed by San Diego Gas & Electric (SDG&E). At SDG&E Mr. Ishii worked in Gas Turbine Maintenance, Research & Development, Gas Operations and the Power Plant Performance Testing Section. His primary responsibilities included performance testing at the 700 MW South Bay Power Plant and 900 MW Encina Power Plant, gas turbine performance testing, engineering support of the liquefied natural gas and gas compressor plants, steady-state and transient power plant simulations, electric production cost model assessments and monthly development of power plant parameters for SDG&E's economic dispatching system.

Mr. Ishii earned his Bachelor of Science degree in Mechanical Engineering from San Diego State University in 1981. He is currently a member of the California Energy Commission's Energy Innovations Small Grant Program Technical Review Board and the California Manufacturing Technology Consulting board of directors.

Mr. Ishii is a member of the American Society of Mechanical Engineers, Association of Energy Engineers and the Instrument Society of America. He is a registered Professional Engineer in the State of California, Certificate No. 22958, and is an AEE Certified Cogeneration Professional as well as a Distributed Generation Certified Professional. Mr. Ishii has authored numerous articles including;

distributed generation, intelligent energy systems, cool storage performance testing, fuel cell testing, and energy systems modeling.

### *Gregory W. Stevens, CMVP*

Mr. Stevens is a Program Manager at Alternative Energy Systems Consulting, Inc. and has over 11 years of consulting experience in energy production, delivery and use. Mr. Stevens provides technical support to utility energy efficiency and self-generation programs. He also provides consulting services directly to utility customers and government agencies.

Mr. Stevens is currently involved with developing SCE's 2010-2012 Retrocommissioning (RCx) Program. Most of his efforts have been focused on developing seven pre-calculated savings measures: chilled water pump VFD, supply fan scheduling, supply fan VFD, condenser water temperature reset, duct static pressure reduction, duct static pressure reset and economizer. He has also been the lead RCx project reviewer since the 2006-2008 program cycle.

At this time, he is also the technical lead for SCE's and PG&E's NRR-DR incentive programs. He is responsible for reviewing energy savings calculations, developing M&V protocol, building simulation modeling and analyzing system performance data to verify savings. Additionally, he is program manager and technical lead for several energy incentive programs administered by the California Center of Sustainable Energy (CCSE): Tax-Exempt Customer, SGIP and CSI incentive programs.

In 2009, Mr. Stevens was a member of the City of San Diego's Energy Efficiency and Conservation Block Grant (EECBG) committee. The twelve member committee advised the City Council and Mayor's office on how to best allocate over $12 million of American Recovery and Reinvestment Act (ARRA) funds to priority energy projects and programs.

In 2003 and 2004, under the auspices of the CPUC and guidance of the Local Government Commission, Mr. Stevens was involved in the initiation of the Redwood Coast Energy Authority (RCEA) and Ventura County Regional Energy Alliance (VCREA). For both REAs he performed over 40 building energy audits for various customer types (commercial, industrial and municipal). His other responsibilities included evaluating performance of building energy systems (e.g., HVAC, lighting, motors, control systems, combustion and heat recovery), building energy simulation and determining project cost-effectiveness.

During his career, Mr. Stevens has inspected over 100 onsite generation facilities – including combined heat and power, photovoltaics, wind and renewable fuel – and conducted over 70 energy audits for various government agencies. He has assisted several recognized corporations with the measurement and verification of various energy efficiency projects: Albertsons, AMTECH Lighting Services, Gelsons Supermarket and Tyler Refrigeration. For these customers, he performed electric load verification, performance monitoring of various equipment (e.g., motors, variable speed drives, compressors, lighting systems and control systems), data acquisition and regression analysis and energy savings modeling.

Mr. Stevens played a major role in designing and developing the first Small Business Standard Performance Contract (SBSPC) program for California's investor owned utilities in 1999. He developed an energy savings estimation tool as well as the measurement and verification (M&V) protocol for all eligible lighting measures. He was also involved in the update and re-design of the 2000 and 2001 SPC programs.

In the past, Mr. Stevens has collaborated on numerous technical and cost feasibility studies of onsite generation: 1-MW Molten Carbonate fuel cell power plant at the Rock Island Arsenal (RIA) in Illinois for the Army Corp of Engineers Construction Engineering Research Laboratory (CERL), a 30-MW gas turbine power plant in Telluride Colorado for the Bureau of Land Management, evaluated several renewable and fossil fuel self-generation options for the South Bay Unified School District (SBUSD) and the San Diego County Office of Education (SDCOE), evaluated several self-generation options for a 3-

MW pumping facility owned by LAVWMA in Pleasanton, CA: photovoltaic, wind, gas turbine, engine generator and mechanical direct-drive.

Mr. Stevens has previously worked on various air quality projects involving electric power generation. As part of these efforts, he coordinated control technology assessments, served as the primary contact with local air districts, evaluated emissions inventories and reviewed regulatory issues. These projects included: three 49-MW gas turbines in three California county air districts - San Diego, San Joaquin Valley and Yolo-Solano, three 47.3-MW gas turbines in San Diego County and two wood waste-fired power plants in Humboldt County, CA – Pacific Lumber Co. and Fairhaven Power Co.

Mr. Stevens was the lead engineer in the emissions testing of a molten carbonate fuel cell power plant at the Marine Corp Air Station Miramar (MCASM). Mr. Stevens developed the test specifications and managed the work of emissions testing subcontractors. The Department of Energy, California Energy Commission and the Gas Research Institute sponsored this project.

Mr. Stevens earned a Bachelor of Science degree in Environmental Resources Engineering from Humboldt State University, CA 1998. He holds a California Engineer-In-Training (EIT) certificate and is an AEE Certified Measurement and Verification Professional (CMVP). He is a member of AEE and A&WMA. He has authored several studies involving energy efficiency and onsite generation.

### *Michael E. Casey, CMVP*

Mr. Casey is a Senior Engineer at Alternative Energy Systems Consulting, Inc. (AESC). He has over 19 years experience in the Energy Engineering and Building Sciences fields, and has worked with AESC as an independent consultant and now as a full time employee for 7 years. At AESC, Mr. Casey provides technical expertise and support to both the Energy Efficiency and Distributed Generation programs.

Mr. Casey currently supports AESC's work in Southern California Edison's Industrial Energy Efficiency and Standard Performance Contract and Programs, and PG&E's 3rd Party Program. In these programs he provides application review for proposed energy efficiency projects and final inspection of completed projects. Mr. Casey also supports AESC's work in both the California Self Generation Incentive Program (SGIP) and the California Solar Initiative (CSI). He reviews applications to these programs for compliance with program guidelines and requirements, including waste heat utilization and system sizing constraints, and performs site inspections of completed projects to verify system performance.

While at AESC Mr. Casey has also developed algorithms for simulating Combined Heat and Power (CHP) operation and other forms of renewable and distributed generation in PLACE3S. PLACE3S is a GIS software tool developed under a California Energy Commission contract that allows land use planners to analyze the effects of deploying renewable and distributed generation within a planning area.

Prior to joining AESC, Mr. Casey worked for Primen (now called Energy Insights), which was then a subsidiary of the Electric Power Research Institute (EPRI). While at Primen Mr. Casey developed and applied software for energy simulation in buildings, and conducted market research and technology assessments for electric and gas utilities and equipment manufacturers.

As an independent consultant, Mr. Casey worked with Itron on the California Commercial End-Use Survey, a CEC project that included on-site surveys of 2,800 commercial premises in California and resulted in commercial building-type characterizations of energy use in the state as a whole and segmented by major utility (SCE, PG&E, SDG&E and SMUD) service areas.

Mr. Casey spent six years working for the United States Environment Protection Agency (EPA) Radiation and Indoor Environments National Laboratory in Las Vegas, NV. In this position, Mr. Casey managed and executed the R&IE's Indoor Environments program; conducted field studies and demonstrations of energy-efficient methods for improving indoor air quality (IAQ) in schools, office buildings and homes.

Before joining EPA, Mr. Casey was a Project Engineer at Science Applications International, Inc. (SAIC). At SAIC, Mr. Casey managed, coordinated, and implemented field tests of energy end-use

technologies including chillers, direct expansion systems, heat pumps, residential cogeneration and thermal energy storage; designed, installed, maintained data acquisition systems for remote field test sites; and provided technical support through frequent communication with customer, manufacturers, and utility sponsors of field tests.

Mr. Casey earned his Bachelor of Science degree in Mechanical Engineering from the University of California, San Diego in 1989. He also earned a Bachelor of Arts degree in Control Systems from UC San Diego in 1981. He is a current member of the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) and the Association of Energy Engineers (AEE). He holds a Certified Measurement and Verification Professional (CMVP) Certification from AEE.

### *Roberto Rivera, P.E.*

Mr. Rivera is the Engineering Manager and technical lead at the Pasadena office for Alternative Energy Systems Consulting. He has over 21 years of experience in project design and management of electrical systems. He is primarily responsible for support functions in energy end-use and energy technology evaluation. He also has consulting experience in energy efficiency, distributed generation technology for both fossil fuel and renewable fuel and photovoltaic system evaluation. Mr. Rivera joined AESC in June 1996.

Mr. Rivera currently supports both the California Solar Initiative (CSI) and Self Generation Incentive Program (SGIP) administered by the three IOUs. His duties include managing workflow with review team, participating in the review process conducting site inspections and coordination efforts with other contractors involved in supporting the CSI program. When necessary, Mr. Rivera provides guidance in areas where the program handbooks require clarification.

Mr. Rivera provided verification support of the Multifamily Element of the Residential Contractor Program for SCE from 1999 to 2001, and also supported the same program for SoCalGas. The support included evaluating applications, verifying energy savings calculations, conducting pre and post installation/modification site inspections (over 350 sites combined), verifying actual kW reduction, kWh and/or therm savings at each site. Mr. Rivera also supported SCE's Standard Performance Contract Program in the same capacity for over a year starting in 1999. Mr. Rivera was instrumental in the early development of the high efficiency motor evaluation tool currently in use by the SPC program. Prior to this, Mr. Rivera Verified energy savings calculations in Southern California Edison's energy rebate program. He used hand calculations and simulation programs to determine energy consumption and savings, conducted site surveys to verify equipment installation and operation, and performed measurements to determine energy use. He also performed customer surveys to obtain rebate program participant feedback. Mr. Rivera was instrumental in developing the motor measure tool for the Small Business Standard Performance Contract (SBSPC). Mr. Rivera also co-authored a report on the viability of DC powered homes for a gas utility in Canada.

Prior to joining AESC, Mr. Rivera worked at San Diego Gas & Electric's Technology and Development section in the distribution department. Mr. Rivera was integral to the construction and start-up of a 250 kW proof of concept molten carbonate fuel cell demonstration plant at the Marine Corp Air Station Miramar, which began operation in 1997. He also participated in a joint effort between SDG&E and Solar Turbines to study the effect of a 7MW generator installed at the manufacturer's facility as a baseline unit with ability to export excess power to the grid. He helped coordinate early efforts with SAFENAV directional drilling and participated in early Ground Penetrating Radar evaluation. He also participated in pilot programs to evaluate the use of radio based fault indicators in underground distribution and the collection of customer metering data using radio based remote metering. Mr. Rivera also wrote proposals for the California Energy Commission PIER funding for research in underground cable testing technologies and interfacing radio based fault indicators with existing SCADA system. Additionally, he participated in collecting and analyzing data for an EPRI study on the utility's distribution department maintenance and operations cost drivers.

Mr. Rivera received his Bachelor of Science degree in electrical engineering from the University of California San Diego in 1994. He is a licensed Professional Electrical Engineer in the State of California. He is also a member of IEEE Broadcasting, Communications and Power Engineering chapters.

### *Enrique Chavez-Castro*

Mr. Chavez-Castro is a Senior Engineer at the Pasadena office for Alternative Energy Systems Consulting. He has over 15 years of experience in heating, air conditioning and refrigeration application and design. He is primarily responsible for support functions in energy end-use and energy technology evaluation. He also has operation, sales and marketing experience in air conditioning and refrigeration applications. Mr. Chavez-Castro joined AESC in January 2010.

Mr. Chavez-Castro currently supports SCE's Energy Management Solutions and the SPC program. His duties will include reviewing applications and mentoring younger engineers in the principles of air conditioning and refrigeration applications.

Mr. Chavez-Castro has been in the HVAC industry for the past 15 years. He is familiar with commercial refrigeration applications ranging from medium high temperatures to low temperature. He has designed complicated ammonia and R404A, R22 industrial and commercial refrigeration systems. He is familiar with the Carrier Block Load Software and E-20 software used for load calculations. He has also used extensively refrigeration load calculation software such as Heatcraft, Refplus and Russell.

He is also capable of specifying uses for all types of heat exchanges, compressors, air handling units, cooling towers, packaged roof top units evaporators and condensers.

Prior to joining AESC, Mr. Chavez-Castro was the regional sales manager for Swep Corporation. Before that he worked at Carrier doing project management and business development and application design. He has traveled extensively in Latin America, Asia-Pacific to perform training in Carrier products.

Mr. Chavez-Castro received his Masters of Business Administration at Rensselaer Polytechnic Institute in 2004. He earned his Masters of Engineering in Industrial & Management in 2009, at the same institute. He earned his Bachelor of Science degree in mechanical engineering from Cal State Northridge in 1993. He has his Engineer-In-Training license from the state of Wisconsin and is a member of ASHRAE.

### *Briana M. Berbée*

Ms. Berbée is a Staff Engineer and Assistant Program Manager at Alternative Energy Systems Consulting. She currently supports the Standard Performance Contract Program administered by Southern California Edison and the Non Residential Retrofit- Demand Response Program administered by Pacific Gas & Electric. She works closely with AESC's Program Manager, Engineering Services Personnel and AESC's various Customers to ensure superior implementation of Programs and Projects. She continually communicates with AESC's Clients to convey Program/Project Status. Ms. Berbée also supports the On-Bill Financing Program administered by Southern California Edison and manages all application reviews for AESC. Additionally, her duties include the evaluation of proposed energy efficiency measures which are reviewed on the basis of eligibility. This process involves energy savings analysis, validating engineering calculations, evaluating appropriate incentive payments, and conducting both pre and post-installation inspections for equipment and system verification. Typical projects include lighting retrofits, cool roof applications, variable speed drives, and energy management systems to control HVAC. Current projects involve the evaluation of an innovative greenhouse design that has been brought over from Holland. Ms. Berbée also provides assistance to Southern California Edison by constructing various work papers, most recently for the UC/CSU/IOU Energy Efficiency Program, which is a unique state-wide energy efficiency program that achieves immediate and continual peak demand and energy savings at UC and CSU campuses.

In addition, Ms. Berbée has assisted in performing integrated energy audits. The goal of the audits is to identify and evaluate potential energy conservation projects that will help the Project Sponsors achieve target reductions in energy conservation. Specific systems of interest include: lighting and lighting

controls, chilled water systems, hot water systems, air-side systems, packaged units, and building shell modifications. Engineering calculations, as well as building energy use simulation tools are utilized to estimate possible savings. Currently, Ms. Berbée provides engineering support to Southern California Edison, in an effort to improve existing energy efficiency programs.

Ms. Berbée previously held the position of Process Development Intern at AMGEN in Thousand Oaks, CA. There she was responsible for the design and implementation of a disposable process to scale-up mammalian cells using Wave Bioreactors. This position required validation of all new equipment along with technical support for the process development department in using the new system.

Prior to her employment at AMGEN, Ms. Berbée interned with Science and Applied Technology, Inc. in Woodland Hills, CA. Her primary function involved engineering drawings and amendments, and was also responsible for developing an organizational system for the parts and production of the Advanced Anti-Radiation Guidance Missile.

Ms. Berbée received her Bachelor of Science degree in Mechanical Engineering from California Polytechnic State University San Luis Obispo in March of 2005. Ms. Berbée is also a certified Engineer-in-Training.

### *Joe Cornillaud, P.E.*

Mr. Cornillaud is a Staff Engineer for Alternative Energy Systems Consulting. He has over four years of consulting experience in consumer and industrial energy efficiency technologies for utilities. Mr. Cornillaud joined AESC in 2005. In that time, he has supported the Standard Performance Contract (SPC) program. The duties performed include the evaluation and verification of various types of energy savings projects. The type of equipment evaluated in this program includes HVAC, pumps, motors, lighting, and compressed air systems. He conducts site inspections ensuring the installed equipment meets the program's installation, operation and configuration requirements.

Additionally, Mr. Cornillaud has managed the testing effort of the SPC Software for the past two years. This effort is to ensure the usability of the software before its release to customers.

Mr. Cornillaud has managed and executed energy savings reviews and analysis in the San Gabriel Valley and Ventura Country Partnership Energy Efficiency Programs. This program was structured in a similar fashion to the Standard Performance Contract in that energy savings submitted by customers are verified through technical analysis employed by sound engineering principles.

Mr. Cornillaud has managed the Agricultural Energy Efficiency Program for Golf Course Customers. This program involved conducting comprehensive energy audits at Golf Course facilities and evaluating potential energy savings measures. These measures included primarily HVAC, lighting, and pump irrigation system upgrades.

Prior to joining AESC, Mr. Cornillaud held the position of General Consultant with Accenture Ltd. There he was responsible for the design and execution of the testing of various business systems and software applications.

Mr. Cornillaud earned his Bachelor of Science degree in Mechanical Engineering from Michigan State University in 2003. His academic career was highlighted by specialized courses in automotive power train design and a series of general mechanical design courses. The last of these courses involved the design and build of a custom cycle for a member of the community with special needs.

Mr. Cornillaud is a LEED Accredited Professional and is a licensed Professional Mechanical Engineer in the State of California.

### *Joseph Ling, P.E.*

Mr. Ling is an Engineer for Alternative Energy Systems Consulting. He currently works on Standard Performance Contract projects and has worked on Energy Audits, Retro Commissioning Projects, Work Paper Development, Software Measure Verification Papers, and SPC Software testing and verification.

Currently Mr. Ling is working on 2009 SPC Project Applications and Installation Reports and assisting with the development of retro-commissioning pre-calculated savings for pump and fan variable frequency drives.

Mr. Ling's primary SPC work has included refrigeration, HVAC, air compressor and server virtualization projects. However, he has had a great deal of experience with other measures submitted to the SPC program such as thermal oxidizers, air filter replacements, high-efficiency injection molders and water pump station upgrades.

For energy analysis Mr. Ling is experienced with the following energy simulation tools: eQUEST, SPC and Engage PC software and AIRMaster+. He also has knowledge or training in the following software: PSAT 2008, Trace 700, EnergyPlus and CPCalc. Additionally, Mr. Ling is well versed in Microsoft Word, Excel, VBA and Power Point.

Prior to joining AESC, Mr. Ling was a student at California State Polytechnic University, Pomona where he graduated with a Bachelor of Science degree in Mechanical Engineering in 2007. Projects during his student career included constructing and programming an autonomous robot, data acquisitioning with LabVIEW, programming engineering calculation tools in VBA, designing an HVAC system for an office building and gear design and construction for a car winch.

Mr. Ling is a member of the Pi Tau Sigma Mechanical Engineering Honor Society and is a licensed Professional Mechanical Engineer in the State of California, license number 34943.

### *Joshua M. Tomashefsky*

Mr. Tomashefsky is an Engineer for Alternative Energy Systems Consulting. He has over 2 years of experience in Energy Efficiency projects for the utilities. Mr. Tomashefsky joined AESC in June 2007.

Mr. Tomashefsky currently reviews energy efficiency projects for the SPC and NRR/DR Programs. These include chiller, air and refrigeration compressors, and lighting retrofits, variable speed drive installations, energy management systems for HVAC and lighting, water treatment plants, and high-efficiency injection molders. Mr. Tomashefsky utilizes several different modeling programs to assist with the review calculations including eQUEST, engage, and AIRMaster+. Mr. Tomashefsky has nearly two years of experience installing monitoring equipment on measure equipment and analyzing the results. Mr. Tomashefsky is also participating in the CEC PIER "Agents for Renewables" which focuses on the utilization of "smart agents" in the Tehachapi area to maximize wind production on the power grid.

Previously, Mr. Tomashefsky assisted with the Bakersfield, Ventura County and UCCSU Partnership work paper efforts. The work papers were used to verify or revise the methodologies used in energy efficiency measures completed in the previous years. Mr. Tomashefsky has managed the update process for the Southern California Edison SPC Review Form, and continues to do so for the latest versions of the Review Form. These changes include Contract revisions, calculation adjustments, and interface changes.

Prior to joining AESC, Mr. Tomashefsky was an Intern Engineer for Pactiv Corporation at the plastics manufacturing facility in City of Industry, Ca. Mr. Tomashefsky created a process for documenting Preventive Maintenance procedures on all of the large process machines. Mr. Tomashefsky also designed and completed construction on Phase 1 of the extruder cooling system. The surface temperatures of the extruded plastic dropped 10 degrees Fahrenheit and became uniform from edge to edge without using more power from the blower and chiller systems.

Mr. Tomashefsky worked in collaboration with International Rectifiers, Texas Instruments, and Cal Poly Pomona in the design and construction of an ultra efficient LED traffic light. The electrical energy input was reduced by 50 percent when compared with similar LED traffic signals already on the market.

Mr. Tomashefsky earned his Bachelor of Science degree in Electrical Engineering from California State Polytechnic University, Pomona in 2007 and holds an Engineer-In-Training certification. Mr. Tomashefsky received a certification in Electrical Measurement training from Lewellyn Technology, Inc., as well as a certification in eQUEST Schematic Design from Southern California Edison, CTAC.

### *Keith Valenzuela, P.E.*

Mr. Valenzuela is a Staff Engineer for Alternative Energy Systems Consulting (AESC). He is primarily responsible for performing energy savings calculation reviews and site inspections for the Standard Performance Contract program for Southern California Edison. Mr. Valenzuela performs pre-installation and post-installation inspections. In addition, he verifies the projects meet the program requirements as well as verifies the calculated energy savings are an accurate estimate and comply with the appropriate program rules. Mr. Valenzuela joined AESC in May 2006.

Mr. Valenzuela has experience calculating energy savings and reviewing energy savings calculations for a variety of energy savings projects including lighting retrofits, variable speed drive installations on fans and pump motors, HVAC retrofits, building envelope modifications (cool roofs and window glazing), retro-commissioning, pumping system retrofits and improvements, air compressor retrofits. etc. To perform these calculations Mr. Valenzuela is familiar with many calculation tools including eQUEST, Engage, SPC Calculation Software, AirMaster + and the Pumping Assessment Tool.

Mr. Valenzuela has experience modeling building HVAC systems with eQUEST to estimate the energy savings for projects including Variable Air Volume (VAV) retrofits, building chiller retrofits, campus central plant retrofits, chilled water pump retrofits and cooling tower retrofits. In addition he has completed two days of training to further his knowledge of the modeling capabilities of the eQUEST software.

Mr. Valenzuela has also prepared technical review work papers for various University of California/California State University / Investor Owned Utilities Energy Efficiency Partnership projects for Southern California Edison and has reviewed applications and energy savings calculations for the Industrial Energy Efficiency Partnership for Southern California Edison.

Prior to joining AESC, Mr. Valenzuela worked at Vista Industrial Products as a Manufacturing Engineer. There he worked with CNC/robotic manufacturing equipment and implemented Lean manufacturing techniques to improve the efficiency of the manufacturing process.

Mr. Valenzuela earned his Bachelor of Science degree in Mechanical Engineering from California State University, Long Beach in 2004, and is a Professional Engineer in the state of California. In addition, Mr. Valenzuela is a member of the American Society of Mechanical Engineers.

### *Daniel S. Hagan*

Mr. Hagan is an Associate Engineer for Alternative Energy Systems Consulting. He has experience with utility-run incentive programs for on-site power generation. Mr. Hagan joined AESC in July 2007.

Since joining AESC, Mr. Hagan has been focused on doing technical application review and site inspection verification for the California Solar Initiative program for Southern California Edison. He also has some exposure to the Self Generation Incentive Program for Southern California Edison.

Prior to joining AESC, Mr. Hagan performed Honors Undergraduate Research at the Computer Mechanics Laboratory at UC Berkeley, where he characterized the fly height modulation of the flying head in hard disk drives, as a function of disk morphology and lubrication, using a Laser Doppler Vibrometer. After graduating, he stayed on at the Computer Mechanics Laboratory as an Engineering Aide. As an Aide, he designed and built an apparatus to de-lube hard disk drives and conducted

experiments to study the phenomenon of hard disk drive lubrication transfer by slider heads under non-contact flying conditions using an Optical Surface Analyzer

Mr. Hagan also worked at Science Application International Corporation as an intern where he modified, assembled, and designed Computer-Aided Drafting models using AutoCAD and SolidWorks.

Mr. Hagan earned his Bachelor of Science degree in Mechanical Engineering from the University of California, Berkeley in 2004.

### *Andrea Miramontes*

Ms. Miramontes, an Associate Engineer at Alternative Energy Systems Consulting, is currently supporting the Self-Generation Incentive Program and California Solar Initiative (CSI) administered by Southern California Edison (SCE). Her duties include application reviews for program compliance comprising all project stages: Reservation Request, Proof of Project Advancement and Incentive Claim, encompassing both technical and financial aspects. She verifies program requirements as prescribed by the program handbooks. This includes host customer demand and system sizing, and existing site characteristics, including electrical loads. She conducts site inspections ensuring the photovoltaic and self-generation equipment meets the program's installation, operation and configuration requirements.

Ms. Miramontes took specialized courses in Heating, Ventilation, and Air-Conditioning (HVAC), heat transfer, materials and advanced machine design. These courses helped build her senior design project, a tabletop zeolite cooling system for a fireman.

Ms. Miramontes received her B.S. Mechanical Engineering in 2007 from the San Diego State University. Ms. Miramontes is a member of Society of Women Engineers and Engineers without Borders.

### *Matthew Seidman*

Mr. Seidman is an Associate Engineer for Alternative Energy Systems Consulting. He has over two years of consulting experience in energy efficiency technologies for utilities and energy users. Mr. Seidman joined AESC in 2008.

Mr. Seidman currently provides technical support to Southern California Edison's energy efficiency programs, including the Standard Performance Contract (SPC) and San Gabriel Valley and Ventura Country Partnership Energy Efficiency Programs.

Prior to joining AESC, Mr. Seidman was an Intern at the National Renewable Energy Laboratory (NREL) in Golden, Colorado. Mr. Seidman was responsible for analyzing the emissions characteristics of Hybrid Electric Vehicles and Plug-in Hybrid Electric Vehicles while at the Center for Transportation Technologies and Systems (CTTS). Upon completing the internship Mr. Seidman prepared a published research paper in the Journal of Undergraduate Research.

Mr. Seidman earned his Bachelor of Science degree in Mechanical Engineering from California State Polytechnic University, Pomona in 2007. Mr. Seidman obtained his Engineer-in-Training (EIT) certification in 2006 in the state of California. Mr. Seidman is a member of the Mechanical Engineering Honor Fraternity, Pi Tau Sigma (ΠΤΣ) and the Association of Energy Engineers (AEE). Mr. Seidman was awarded the Boy Scouts of America, Eagle Scout Award on October 27th, 1999.