Bruce S. Ceniceros, Principal Demand Side Specialist, SMUD

Education

BS, Mechanical Engineering, University of California at Santa Barbara, 1987
BA, Environmental Studies, University of California at Santa Barbara,1987

Research and Professional Experience

Sacramento Municipal Utility District, Principal Demand Side Specialist Customer Strategy October, 2004 to present

- Solar Smart residential new construction program
- Advantage Homes new construction program
- Sacramento Shade tree planting program
- Home Energy Displays program
- Home Energy Reports behavioral program
- Residential Advisory Services (home energy audits, online audit tools, information tools
- Whole House Performance Program
- Home Energy Rating System market development effort
- 2007 "LEEDERs" project to reinvent and integrate innovative rate designs with efficiency, demand response and renewables programs, supported with comprehensive marketing strategies.
- Social-science based program development to influence residential customer behavior
- Co-managed the 2007/2008 energy efficiency portfolio redesign that resulted in more than doubling SMUD's annual goals for energy efficiency savings and introducing a suite of new, integrated programs.
- Facilitated cross-departmental effort to develop processes to strategically guide SMUD's energy efficiency RD&D efforts and preestablish pathways for new technologies to move into market programs.
- Facilitated the 2005 cross-departmental effort to take SMUD's new solar home demonstrations to market scale
- Project Manager for redesigning Home Energy Reports program to bring them from pilot to market scale in 2009.

California Energy Commission (CEC), Energy Specialist, Energy Efficiency Division, June 1989 - September, 2004.

Residential Buildings and Appliances Office (CEC), Energy Specialist II, Sept. 1999 - Present

- Project Manager for the AB 549 Report to the Legislature: a statewide plan for reducing peak energy consumption in California's existing residential and nonresidential buildings.

- Program Manager, Innovative Peak Load Reduction and Renewables Program
- Program Planning Coordinator, Residential Buildings
- Program Planning lead, AB 1105 report to the California legislature on administrative options for Public Goods Charge energy efficiency programs.
- CEC Liaison to Consortium for Energy Efficiency

Program Planning Office (CEC), Energy Specialist I, May 1997- Sept. 1999

- Technical Lead for Market Research for the Energy Efficiency Division
- CEC Liaison to the CPUC for public benefit Energy Efficiency Programs.
- Member, Technical Advisory Committee for the California Board for Energy Efficiency (CBEE).
- Technical Evaluator, energy efficiency R&D proposals to the Public Interest Energy Research (PIER) program

Efficiency Services Office (CEC), Associate Energy Specialist, October 1990 - May 1997

- Program Manager for the Water Energy Efficiency Program:
- Subject-matter expert for CEC staff on AB 1890 electric industry restructuring.
- Commercial Sector Project Lead for the 1992 Energy Efficiency Report to the Legislature

Local Assistance Office(CEC), Energy Analyst, June 1989 – June 1993

- Program Manager, County Hospitals Program
- Project manager for the Energy Partnership Program

Mechanical Engineer, Western Power Management (now Onsite Energy) February 1989 to June 1989

- Measurement and verification technical lead
- Energy management engineer

Department of Environmental Studies, UC Santa Barbara, Mechanical Engineer January 1987 to January 1989.

- Lead researcher for wind energy projects.
- Lead author for final report for wind energy resource assessment grant project for the California Department of Transportation
- Lead technician for monitoring and data analysis

ED H. HAMZAWI, P.E., Process Coordinator, Sacramento Municipal Utility District

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Education and Training

University of Colorado at Boulder, Master of Science, Civil Engineering, with specialization in the area of Building Energy Engineering, 1984
University of California at Davis, Bachelor of Science, Civil Engineering, 1982,with High Honors.
Lifetime member of Tau Beta Pi, National Engineering Honor Society
Registered Professional Mechanical Engineer with the State of California since 1990; License number M27306

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Research and Professional Experience

SMUD, Process Coordinator, Sacramento, CA, 12/07 – Present

- Supervisor for the Programs and Services group of the Customer Services Business Unit. Leading a team of 25 people in implementing and managing the District's energy efficiency programs. Programs include a wide range of implementation models and the full spectrum of residential and commercial customer segments, covering currently about a dozen different programs with a combined total budget of approximately $28 Million. These include direct customer-facing rebate programs; upstream retailer and manufacturer incentive programs; complex commercial and industrial audit and replacement programs; as well as contractor or third-party delivered programs.
- Supervised and oversaw the implementation and launch of several innovative energy efficiency programs; notably and recently a Whole-House Performance program for residential customers that provides for home improvements designed to maximize energy efficiency and comfort for occupants, and a Business and Consumer Electronics efficiency program which provides upstream retailer and manufacturer incentives for the delivery and sales of very high efficiency electronic components in local markets.
- Coordination of programs and service components, including rebate and incentive levels, marketing campaigns, legislative initiatives, research and development efforts and other elements with external and internal stakeholders to ensure regional collaboration, consistent customer experience, maximum market penetration, and long term program success within constraints of available budgets and resources.

SMUD, Supervising Demand Side Specialist, Sacramento, CA, 5/99 – 11/07

- Supervisor in the Planning and Measurement & Evaluation groups, respectively of the Customer Strategy Department. Responsibilities included directing a team of planners in the development of detailed customer energy efficiency, renewable energy, load management, and low-income assistance programs as part of the District's strategic directives and policies in these areas.
- As Supervisor of the Measurement & Evaluation group, developed and implemented Measurement and Evaluation business plans and projects for Energy Efficiency and Load Management programs. Project results were used to improve the effectiveness of various programs offered by SMUD to residential and commercial customers.
- Projects involved working with research, planning, and implementation staff in cross-functional multi-disciplined teams to design and develop program plans, goals, measurement metrics, and verification strategies to monitor program performance, budget expenditures, and customer response.

RLW Analytics, Senior Consultant, Middletown, CT, 6/97 – 4/99

- Project Manager and Senior Analyst at RLW Analytics, a resource planning/engineering and economic analysis consulting firm. Provided technical services to public and private utilities in the competitive and transitional aspects of utility market deregulation, as well as traditional planning and analysis at the utility system and customer levels.
- Involved in supervisory and staff roles with a wide range of residential and commercial projects in electricity supply, distribution, and demand-side management for local, regional, national, and international utilities and public organizations. Clients included Northeast Utilities, Massachusetts Electric, New Jersey Public Service Electric & Gas, Jamaica Public Service Company, Texas Utilities, and Southern California Edison.
- Developed databases of load profiles and energy use for residential and commercial market segments in California and Texas by climate region using engineering modeling techniques. These databases were components of software information systems designed to support energy efficiency program design and predict hourly loads on utility systems for a user-defined population of customers.

NEOS Corporation, Sacramento, CA, Senior Consultant, 2/92 - 3/97

- Manager of the Sacramento regional branch of NEOS Corporation, an energy engineering and economic consulting firm. Supervisor of a staff of engineers, economists, programmers, analysts, and support personnel deployed to meet client and project needs. Projects specialized in the areas of resource planning and energy efficiency and conservation program development in the public power market. Principal clients included the Western Area Power Administration and other regional wholesale power providers, municipal utilities, and electric cooperatives.
- Senior Project Manager and lead analyst for a wide variety of projects. These included development of short and long-term resource planning models; integrated local and regional demand and supply resource assessments; energy efficiency planning, program design, implementation, and evaluation projects; construction and equipment technology cost database development; and economic and demographic data collection and analysis. Projects ranged from small short-term assignments to large-scale multi-year efforts.

California Energy Commission, Energy Specialist, Sacramento, CA, 10/87 – 2/92

- Served as commercial sector lead, responsible for production of the California Energy Commission's biennial long-term forecast of electricity and natural gas resource needs in these market segments. Performed analyses of economic and demographic projections, and local and regional commercial building stock and equipment data. Developed engineering estimates of predicted energy and peak demand loads at the end-use and aggregate level.
- Responsible for working with staff and contractors both downstream and upstream of the forecast to ensure the proper and timely gathering of data necessary to produce the forecast, as well as timely distribution of data and results to resource planners on the supply side of the process chain. Forecast requirements included accounting for the effect of short-term and long-term economic factors, changes in building and equipment standards, and market penetration of new or emerging technologies.
- Prepared and presented testimony at public hearings and authored reports for publication and presentation at technical conferences. Conducted contract management activities, involving development of Request For Proposals, proposal evaluation, contractor selection, and supervision of projects carried out by contractors outside the Commission.

Richard Oberg, P.E., Supervising Demand Side Specialist, Sacramento Municipal Utility District (SMUD)

Education and Training

Portland State University, B.Sc. Mechanical Engineering

Research and Professional Experience

SMUD, Supervising Demand Side Specialist, 2008 – Present

- Planning supervisor for all energy efficiency (EE) and demand response (DR) programs for the Utility. Supervision includes planning personnel, budget, metrics, and energy efficiency portfolio.
- Representative for EE/DR on the Utility's Integrated Resource Planning (IRP) steering committee.
- Team member for transition to new enterprise-wide CRM software, representing District strategy and EE/DR planning needs.
- Member of SAP Demand Side Management (DSM) Influence Council helping SAP integrate DSM programs and projects functionality into their product offering.

SMUD, Principal Demand Side Specialist, 2003 – 2008

- Program planner for commercial/industrial sector. Provided planning (budgeting, goal-setting, and plan development) and planning team member expertise for all SMUD commercial/industrial energy-efficiency programs and revenue/customer service programs. Helped facilitate transition to unit cost budgeting model.
- Managed contract to develop load shapes for energy efficiency and demand-response measures.
- Assisted in transition to new metrics tracking and reporting tool.
- Oversaw transition of the Market-Transformation Incentive (MTI) Spreadsheet to the SalesLogix CRM (Customer Relationship Management) platform. Work included developing incentive equations, testing model, and training end-users.
- Provided data for commercial/industrial inputs on energy efficiency measures for an energy efficiency portfolio redesign effort.
- Prepared results of commercial/industrial energy efficiency programs for California Energy Commission (CEC) reporting purposes.

SMUD, Demand Side Specialist, 2000 - 2003

- Team member responsible for providing research and evaluation for 11 commercial/industrial conservation programs, three commercial/industrial revenue programs, two residential load management pilot programs, and four electric vehicle programs.
- Provided program planning for California SB5X Funds. Was responsible for planning the C/I Compact Fluorescent Program and the Large C/I Rebate Program.
- Supervised data collection for evaluation of SMUD Advantage Home Program. Oversaw the data collection, whole house metering, and air-conditioning end-use metering. 92 homes were included in the study. Contract manager for contract with Digital Air for air-leakage testing. Results from evaluation were provided at

a poster session for the International Energy Program Evaluation Conference (IEPEC).
- Managed and modified the MTI spreadsheet for use by the Commercial/Industrial Energy Specialists. Revised existing MTI Spreadsheet to include SB5X rebate levels and demand associated with 2-6 PM time period. Presented revised spreadsheets to Energy Specialists.

Neos Corporation, Senior Associate, 1997 – 2000
- Managed and conducted analysis for utility company service contracts benchmarking project for the Electric Power Research Institute.
- Developed Windows-based operating shell software with load profile estimation capabilities for DOS-based DOE-2 energy simulation software for Sempra Energy Solutions.
- Developed building energy simulation prototypes and performed DOE-2 energy baseline and conservation simulations on 50 commercial buildings for the Electric Generating Authority of Thailand.

Quantum Consulting, Senior Associate, 1992 – 1997
- Conducted electric load monitoring, on-site data collection efforts, and engineering analysis for impact evaluation of Pacific Gas and Electric's 1996 Commercial Rebate program for existing buildings.

Publications

1. *Post-Occupancy Residential Survey*. CEC Publication #P400-94-015. State Of California: California Energy Commission (CEC). October 1997.
2. *Comparison of Residential Building Standards Projects.* CEC Publication #P400-94-015A. State Of California: California Energy Commission (CEC). October 1997.

Synergistic Activities

1. Survey coordinator and performed quality assurance for BPA Non-Residential Building Survey.
2. Member, American Society of Heating, Refrigeration, and Air-Conditioning (ASHRAE)

EDUCATION AND TRAINING

Lincoln Law School (Completed One Year)
California State University Sacramento, B.A. English and Sociology, 1986
SMUD Board Recognition for Outreach, 2003
Slavic Assistance of Sacramento Recognition, 2004

RESEARCH AND PROFESSIONAL EXPERIENCE

Communication and Community Relations, *Community Engagement*, May 2007 – Present

Responsible for deepening the relationships SMUD has with its many customers through strategic planning, program development, sponsorship coordination and employee volunteerism. **Job Duties**: engaging and building partnerships with SMUD customers (business, community-based, civic, social service organizations, chambers, faith-based and multi-ethnic organizations) to promote SMUD's *Compact with the Customer*; coordinating District-wide projects through departmental collaborations (internal Website/database and a CRM tool); promoting and strategically placing SMUD employees in the community as ambassadors.

- Developed a customer outreach team, consisting of employees from various departments
- Advised program teams on integrating community engagement and multi-ethnic marketing strategies into their 2008 program plans
- Consultant on a District-wide project to identify and update multi-lingual SMUD employees
- Revising and implementing the District's sponsorship process
- Coordinator of the District's Oak Park CFL exchange project
- Presentation to a National Chartwell audience, ***"Multi-Cultural Outreach"***

Communications and Advertising Services, *Outreach Coordinator*,April 1999 – May 2007

Responsible for the Districts community outreach efforts; that is, I developed strategies market and advertise programs and services to SMUD's low-income, recent immigrant and other "hard-to-reach" customers; **Job Duties:** creating partnerships with community-based, social services, faith-based, multi-ethnic and other organizations; developing and translating ads and collateral materials in twelve different languages; developing relationships with community leaders; creating a work environment at SMUD that encourages management and employees to view employees' cultural and ethnic competencies as a business asset and not liabilities; targeting and encouraging SMUD's diverse employees to staff a booth at a Hmong New Year event or to participate in a Spanish radio interview, perhaps translate ad copy into Vietnamese or review a Russian translated program brochure.

- Developed an outreach advisory council for the purpose of marketing programs
- Established partnerships with Department of Human Assistance, Department of Health and Human Services, SETA and other CBO.
- Increased by 100 percent the number of customers on the EAPR program while raising EAPR awareness for six consistent years across all customer segments.
- For seven plus years managed a 200k budget / WBS
- Working with HR staff, developed in-language Russian radio spot with was successful results
- Managed and staffed more than 50 outreach events (Pacific Rim Street Festival, Festival De La Familia and Black Expo, including various Lunar New Year events).

March 1997 – April 1999 – Borders Books and Music, *Community Relations*.
Responsible for all marketing, sales and entertainment at the Pavilion Store. **Job Duties:** writing a monthly events news letter which included Jewish High Holy Days, Mexican Independence Day, Lunar New Year events and others; advertising (print); principle negotiator for contracts associated with authors, publishers and all other in-store activities; maintained an annual marketing budget.

- Negotiated three national best-selling author in-store appearances.
- Instrumental in securing other Borders store in the Sacramento Market.
- Met marketing and sales goals for the two years of my tenure.

September 1994 – March 1997 – Evaluation Management and Training (EMT), Evaluator.
Responsible for conducting process and outcome evaluations on Department of Drug and Alcohol programs. **Job Duties**: establishing benchmark measurements, setting-up program metrics, on-site observations, documentation and reports.

- Implemented/managed from start to finish State-funded evaluation projects.
- Demonstrated through empirical data the impact of specific programs on students' attitudes and behaviors

July 1991 – August 1994 – KCRA's Safe Streets, *Program Director*.
Responsible for evaluating the pilot program in Tacoma, Washington and Sacramento operations. **Job Duties**: Evaluating the pilot program; reporting to Jon Kelly (Board President); developing a program to address the specific needs of Sacramento; writing the program manual; working with KCRA staff, putting a promotional video together; introducing the concept of the program and its benefits to the community stakeholders; recruiting an executive director to run the program.

- Successfully evaluated and implemented the program in Sacramento.
- Received positive community and board evaluations.
- Raised over $300K for the program first three years of business
- Developed important relationships with community and business leaders

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SYNERGISTIC ACTIVITIES

1. **Board President, Sacramento State University Alumni,** Present
2. **CSUS President Gonzales' Advisory,** Present
3. **OK (Our Kids) Board of Directors,** Present (drugs and gang prevention program)
4. **President, MLK365 Board** (Martin Luther King Jr. march and celebration), Present
5. **Founder of California Forum Crossroads** (Community Dialogue), Present
6. **SACOG** (Metropolitan Transportation Plan) (2 year Term)
7. **Director and Board Secretary, Nehemiah Housing Corporation of America,** Present
8. Chairman of Personnel and Contracting Practices Committee
9. **National Association For the Advancement of Colored People Board** (completed)
10. **SACTO** (Representative)

Panama Bartholomy, Advisor for Karen Douglas

Education and Training

Humboldt State University, B.S.,Restorative Development
UC Davis Masters of Science in Community Development

Research and Professional Experience

CA Energy Commission, Environmental Advisor for Chairman Karen Douglas

- Panama is an advisor for Karen Douglas, the Chairman at the CA Energy Commission where he advises her on climate change, land use, renewable energy, transmission, green building, and biofuels policy.
- He serves on the City of Sacramento's Planning Commission and the County of Sacramento's Environmental Commission.
- He is a board member on and Vice-President of the Northern California Chapter of the United States Green Building Council and the Humboldt Bay Center for Sustainable Living.
- He previously worked for the California Conservation Corps on vocational environmental education and the Division of the State Architect where he ran the Sustainable Schools program.

G. William Pennington, Manager, High Performance Buildings and standards Development Office

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Education and Training

UNIVERSITY OF CALIFORNIA, B.S. BUSINESS ADMINISTRATION/OPERATIONS RESEARCH, 1971.
CALIFORNIA STATE UNIVERSITY, MASTERS OF BUSINESS ADMINISTRATION PROGRAM, 1972-76.

Research and Professional Experience

HIGH PERFORMANCE BUILDINGS AND STANDARDS DEVELOPMENT OFFICE EFFICIENCY AND RENEWABLE ENERGY DIVISION CALIFORNIA ENERGY COMMISSION, Manager, 7/09-Present

- Plans, organizes and directs the integration of energy efficiency and onsite solar electric generation technology to accomplish California energy and climate change policy and mandates, including aggressive advancement towards zero net energy buildings through the development of mandatory and "reach" standards for incorporation in California's Building Energy Efficiency Standards and California's Green Building Standards, the development and implementation of residential and commercial building energy rating and labeling programs (including HERS II).
- The development and implementation of guidelines to require high performance solar homes and buildings to qualify for state incentives for photovoltaic systems under the New Solar Homes Partnership and California Solar Initiative programs, and the development and implementation of a comprehensive energy efficiency program for California's existing residential and commercial buildings, including the development and implementation of California's retrofit programs under the American Recovery and Reinvestment Act State Energy Program, and collaboration with the California Tax Credit Allocation Committee to expand the availability of state and federal tax credit support for energy efficiency and solar investments in affordable housing. (Office Manager II)

BUILDINGS AND APPLIANCES OFFICE EFFICIENCY AND RENEWABLE ENERGY DIVISION CALIFORNIA ENERGY COMMISSION, Manager, 7/03

- Planned, organized and directed an inter-disciplinary staff of 37.5 permanent employees, and several technical contract teams in developing, implementing and enforcing building energy efficiency and appliance efficiency standards and pursuing related climate change initiatives, including zero net energy buildings, home energy ratings, green building standards, building benchmarking and building commissioning programs aimed at maximizing the combination of energy efficiency and solar technologies in newly constructed and existing California buildings. Guided and actively coordinated with multi-million dollar Public Goods Charge funded utility Codes and Standards programs and Public Energy Interest Research intended to expand and improve Standards. Provided technical and policy advice for improvement and transformation of the Commission's energy efficiency and solar programs to respond to emerging issues. Actively coordinated with and represented California interests in international, national, state and local government and private sector program initiatives pursuing energy efficiency, climate change mitigation, green and sustainable buildings.
- Actively pursued enhancement of legislative and administrative policy and expanded resources to best utilize and improve the effectiveness of the Commission's Standards

to deliver the economic, environmental and health and safety benefits anticipated for them. (Office Manager II)

BUILDING STANDARDS DEVELOPMENT CHIEF ENERGY EFFICIENCY PROGRAM SPECIALIST, DEPUTY DIRECTOR'S OFFICE,11/95

- Provided technical and policy advise to the Deputy Director for Energy Efficiency regarding improvement and transformation of Commission energy efficiency programs to respond to emerging opportunities and issues. Investigates, analyzes and proposes strategies to respond to evolving national energy efficiency programs, opportunities for public/private partnerships, and approaches to improve the delivery of Commission energy efficiency programs. Communicated with stakeholders both nationally and in California to understand their views and coordinate development of mutually beneficial positions and initiatives. Acted as a consultant to Division management and technical staff and as a project leader on complex and high priority projects, including development of a program of Commission oversight for California HERS (home energy rating systems), and reinvention of the Building Energy Efficiency Standards to increase their reliability by focusing on verification of field performance. Managed the Division wide project to develop and implement emergency Building Energy Efficiency Standards pursuant to the Assembly Bill (AB) 970 mandated response to California's electricity crisis. Managed the Division wide project to develop and implement the 2005 Building Energy Efficiency Standards as Phase II of the response to the AB 970 mandate. (Office Manager I)

CALIFORNIA ENERGY COMMISSION, SPECIAL ADVISOR TO "SCIENTIST/ENGINEER" COMMISSIONER COMMISSIONER ART KEVORKIAN, P.E. COMMISSIONER DOUG NOTEWARE, P.E. COMMISSIONER DAVID ROHY, Ph.D. 1990-1995

- Provided advise on engineering, scientific, economic, legal and policy implications of proposals or decisions before the Commission. Assisted the "Scientist/Engineer" Commissioner in understanding and reconciling conflicting impacts and points of view, and advised the Commissioner on appropriate courses of action. Advised Commissioners with presiding member or second member roles for the Efficiency Standards, Conservation Programs and Report, Fuels Report and Planning, Siting and Regulatory Procedures, Electricity Report, and RD&D Report and Program Committees. Provided advise and assistance to other Commissioners on policy and management issues, particularly related to energy efficiency standards and programs. (CEA I)

OFFICE OF THE EXECUTIVE DIRECTOR CALIFORNIA ENERGY COMMISSION, ELECTRICITY REPORT, Project Director, 1987-1990

- Planned, organized and directed development of the 1990 Electricity Report, a large, inter-divisional project to 1) forecast the demand of electricity in each of the State's utility service areas; 2) evaluate the statewide environmental, energy security, and economic impacts of existing and alternative resource to meet the forecasted demand; and 3) develop Commission policies regarding preferred future resources. (Office Manager I)

Nancy McKeever, California Air Resources Board, Office of Climate Change

Education and Training

Pennsylvania State University, B.S., Environmental Resource Management, 1978
Cornell University, Course work completed for M.S., Natural Resource Management
University of California, Davis, California, 9/81 - 6/85

Research and Professional Experience

6/2009 – Present, Air Pollution Specialist, Office of Climate Change, California Air Resources Board, Sacramento

- Primary responsibility for promoting building energy efficiency programs to support attainment of climate goals stated in the Scoping Plan pursuant to AB 32, Global Warming Solutions Act of 2006.
- Develop productive partnerships with broad range of public and private entities and elected officials to help secure durable building efficiency programs.
- Provide public education and outreach to promote understanding and valuing of building energy efficiency and related climate goals.

1987-5/2009, Program Manager, Energy Efficient Regional and Local Planning, California Energy Commission, Sacramento

- Primary responsibility to develop and manage programs designed to help regions and local governments become more economically, environmentally and socially sustainable.
- Develop and apply the I-PLACE^{3}S software for integrated land use, transportation, housing, environmental and economic decision support and planning. I-PLACE^{3}S is an internet-accessed urban design, analysis and public involvement method designed specifically for regional and local governments to quantify the economic and environmental effects of growth and development decisions on overall sustainability.
- Partner with county and city governments to transfer regionally prepared assessments into General and Specific Plans to improve the linkages between multiple levels of policy.
- Climate Action Team, Land Use Sub Group, Coordinate the regional and local government input. Participate in outreach meetings and assist the participants in developing their input for the Scoping Plan and GHG emission quantification tasks.
- Regional Blueprint Planning Program, Commission lead on working with regional and local governments to develop and adopt Regional Blueprint Plans. Commission representative to Caltrans' Blueprint Agency and Advisory committees.
- Energy-Aware Planning Program, Initiate program to provide local governments with energy conserving land use, transportation, building, water use and recycling policy and implementation program information. Published a guidebook that provides economic and environmental impact information and over 115 local government program examples and contacts. Promoted program statewide. Currently updating the Energy-Aware Planning Guide to better assist local governments with policy and implementation needed to address state greenhouse reduction goals.
- Land Use Author, Integrated Energy Policy Report. Author, 2005 Staff Report, *Energy Effects of Land Use and Transportation Planning*. Co-authored 2007 Staff Report, *The Role of Land*

Use in Meeting California's Energy and Climate Change Goals.

- San Diego Regional Energy Plan, Euclid Trolley Station PLACE^{3}S Urban Revitalization Program, and Mid Cities Transportation Infrastructure Plan, Managed each program and enhanced the I-PLACE^{3}S capacity to analyze integrated assessment of overall program sustainability.

1985-1987, Project Manager, Environmental Analysis, URS Corporation, Sacramento

- Primary responsibility to direct team of environmental and economic professionals to produce comprehensive NEPA and CEQA documentation.
- Marketing, proposal writing, hosting public meetings and public speaking.

1981-1985, Program Development Manager, Advanced Programs Division, Rockwell International, Canoga Park, CA

- Primary responsibility to initiate innovative energy programs from leading aerospace technology.
- Technical research, briefings, and program marketing to broad audiences.
- Secret Level national security clearance.

1978-1981, Program Manager, Energy and Environmental Analysis, Inc., Arlington, VA

- Primary responsibility to provide soil, water, land use, and energy assessments for US DOE, US EPA, and other clients.
- Technical research, writing, presentations.

Synergistic Activities

- American Planning Association, Contributor to development of new advanced credentialing program for highly-experienced planners, 2009
- National American Institute of Certified Planners, Contributor to "Making a Difference with Green Infrastructure" educational seminar and webcast, 2008
- Economic Development Administration, Contributor to "Seeing the Green: Bolstering Economic Development Strategies with Environmental Responsibility" educational telecast, 2008

Anthony R. Eggert, Senior Policy Advisor, California Air Resources Board

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Education and Training

UNIVERSITY OF CALIFORNIA, DAVIS, MS Transportation Technology/Policy – Research Fellowship, SEPT 2001
UNIVERSITY OF WISCONSIN, MADISON
BS Mechanical Engineering, Academic Distinction, MAY 1996

Research and Professional Experience

CALIFORNIA AIR RESOURCES BOARD *Senior Policy Advisor – Office of the Chair (Sacramento, CA)*, 2007-Present

- Advise Chair of ARB, Mary Nichols, on all issues relating to climate policy (AB32), renewable, vehicle and fuels policy, and national environmental policy
- ARB Liaison to other California state agencies (Resources, CEC, PUC, OPR) and Governors office on state and federal climate and energy policy
- ARB representative to the California Climate Action Team, Governors Climate and Forestry Task Force, Strategic Growth Council, and California Green Building Standards Code Advisory Council
- Represent ARB at conferences, public workshops, and with media.

UNIVERSITY OF CALIFORNIA, OFFICE OF THE PRESIDENT, Energy Policy Advisor, Federal Govt. Relations, 2007-Present

- Advise federal legislative and committee staff on legislation relating to renewable energy, fuels, and climate policy. Advise UC administrators, faculty and research staff on opportunities for greater federal policy engagement.
- Liaison to California Governor's office, Air Resources Board and other CA Govt. agencies on federal climate policy.

UNIVERSITY OF CALIFORNIA, DAVIS, *Associate Research Director – Institute of Transportation Studies*,2002 - 2006

- Responsible for the project management, research direction, fundraising, hiring, course development, and student advising.
- Successfully worked with development and research staff to build the program from $50,000 seed funding (1 sponsor) into a 21 sponsor $750,000/yr research consortium. Leveraged these funds for approximately $1M/yr total program budget.
- Assisted in design and scoping of 21 interrelated research projects, facilitated 10 major workshops and meetings to provide research results and obtain input and buy-in on projects from senior academic, industry and government partners. Presented findings at 50+ national and international conferences. The program has generated over 200 papers, presentations, and models since inception.
- Testified and briefed California state lawmakers and US House and Senate on subjects related to advanced vehicles and alternative fuels.
- Led the successful grant proposal and managed 1st year of $750,000 USDOE Center of Excellence for the training and education of engineers and scientist working on fuel cell, hydrogen, and hybrid vehicle technologies. Co-developed and taught classes on advanced vehicles and low-carbon fuels.
- Co-author of technical and policy reports that formed the basis of California's Low Carbon Fuel Standard (LCFS).

FORD MOTOR COMPANY, *Manager CaFCP – Think Technologies*, 2001 - 2002

- Responsible for managing the Ford Motor Company California Fuel Cell Partnership (CaFCP) facility including all aspects of budget, personnel, and project management.
- Developed and initiated Ford's strategy for fuel cell vehicles deployment including customer selection, infrastructure planning, vehicle service, and funding. Coordinated with energy providers and other automakers to determine the logistics and siting of infrastructure.
- Chair of the CaFCP Safety Team (2002). Initiated and managed projects related to vehicle, facility and fueling station safety. Represent Ford Motor Company in the other working groups of the CaFCP including the vehicle operations, planning, infrastructure, and communication groups.
- Coordinate technical and PR logistics for participation in vehicle demonstration, media and educational outreach events and represented Ford Motor Company and the CaFCP at those events.

Project Engineer – Vehicle Environmental Engineering, 1996 - 1999

- Part of a team responsible for ensuring the CARB and EPA compliance of $250 million worth of new emissions test equipment for exhaust and evaporative emissions testing.
- Researched the state of technology and policy implications of Ford's alternative fuels and hydrogen fuel cell program. Delivered a detailed strategic analysis of Ford's fuel cell vehicle program to upper management in the environmental policy and governmental affairs divisions at Ford.
- Worked with USEPA and California ARB to streamline emissions regulation testing protocols.
- Recruiter for division at University of Wisconsin - Madison

QUANTUM CHEMICAL, Project Engineer, 1993-1995

- Developed overhaul manual, developed preventative maintenance program and taught seminar on reciprocating compressors. Designed and implemented changes on reciprocating and rotating mechanical equipment.

Rick Wylie, President, Beutler Corporation

Education and Training

Del Campo High School, General Education, 1974
American River College Apprenticeship Program, Sheet Metal Service Technician, 1982
National University, Various Business Management classes, 1992

Research and Professional Experience

Beutler Corporation, President 1986 - present.

- Overall Business Strategy and Operations.

Beutler Corporation, Vice President/ Chief Estimator 1983 - 1986.

- Oversight of all engineering, pricing, and sales.

Beutler Corporation, Apprentice/Journeyman Sheet Metal Service Technician 1979 – 1983.

- Installation and service of HVAC and Sheet Metal systems.

Warehouseman, Beutler Corporation, Warehouseman,1976 – 1978.

- General warehouse duties.

Synergistic Activities

1. Certified Energy Analyst, California Association of Building Energy Consultants (CABEC)
2. Certified Energy Rater, California Home Energy Efficiency Rating Service (CHEERS)
3. Co-Chair, Trade Builder Alliance Council, North State Building Industry Association.
4. Steering Committee Member, HVAC Performance Alliance, California Public Utilities Commission (CPUC) special HVAC Taskforce, charted in 2009

Wesley Schultz, Professor of Psychology, California State University

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Education and Training

University of California, Irvine, B.A. Psychology, 1990
University of Maine, M.A. Psychology, 1992
The Claremont Graduate School, Ph.D. Psychology, 1995

Research and Professional Experience

California State University, Professor of Psychology, 1997 – Present

- Hired as Assistant Professor, promoted to Associate in 2000, and then to full professor in 2005.

Action Research, Senior Scientist, 2001 - Present

- Served as consultant on numerous research contracts, focusing primarily on the behavioral elements of program design.
- Offered technical consulting in the areas of community-based social marketing, survey design, program evaluation, and statistical analyses.

Synergistic Activities

1. Published more than 30 peer-reviewed papers in some of the leading scientific journals.
2. Written or edited four books.
3. Given more than 100 professional presentations at scientific societies, universities, and private organizations around the world.
4. Maintained a very active program of basic and applied research, with funding coming from both private and public sources. Current research funding comes from the Environmental Protection Agency, National Institutes of Health, City of San Diego, and Ogilvy Public Relations. Through Action Research, he has conducted or consulted on projects for dozens of organizations, including Southern California Edison, the Hewlett Foundation, Brookfield Zoo, the San Diego Zoological Society, EDCO Waste Management, and the National Academy of Sciences.

Dr. Iain Walker, Staff Scientist, Lawrence Berkeley National Laboratory

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Education and Training

University of Alberta, B.Sc. Mechanical Engineering, 1986
University of Alberta, M.Sc. Mechanical Engineering, 1989
University of Alberta, Ph.D. Mechanical Engineering, 1993

Research and Professional Experience

Lawrence Berkeley National Laboratory, Staff Scientist, 1995-present

- Performed research on projects related to energy use, peak demand, moisture issues, comfort and health in buildings. Key research areas include: retrofits, diagnostics, performance of air handlers, longevity of duct sealants, thermal and moisture performance of attics, air flow resistance of ducts, air flow around buildings, residential infiltration, infiltration heat recovery and residential HVAC simulation. Leader of the Environmental Energy Technology Division Residential Integration Team.

Home Energy magazine, Executive Editor and Secretary of the Board, 2003-present

- Responsible for technical content of Home Energy magazine (www.homeenergy.org), direction of other editorial staff, and oversight of administrative activities. Home energy magazine is the leading U.S. publication for energy use in residential buildings and is a key resource for utility programs, contractors and policy makers.

Building Science Consultant. 1992-present

- Provided consulting services to many organizations including: AHRI, EPB Consulting Group, Pacific Gas & Electric Co., ConSol, Building Science Corporation, Integrated Building and Construction Solutions (IBACOS), Liquaire, Inc., Natural Resources Canada/SCANADA Consultants, Inc., XENERGY Inc., SYMBIOS Ecodesign and Construction, Steven Winter Associates, Inc., Sheltair Scientific, University of Waterloo.

Institute for Research in Construction, National Research Council Canada, Research Associate, 1993-1995

- Led research on field monitoring of building envelope systems for pressure equalisation, moisture penetration and thermal performance and high resolution Infrared thermography.

Synergistic Activities

1. Performing research for the US DOE on Deep Retrofits in residential buildings, residential ventilation and residential HVAC systems. Performing research for the California Energy Commission on Indoor Air Quality in Multi-Family buildings and residential HVAC systems.

2. Technical support for: i) local governments on energy performance of residential buildings, e.g., City of Berkeley RECO; ii) ACI/NorCal Collaborative 1000 Home Challenge for deep energy retrofits in homes; iii) Building Performance Institute Standards Technical Committee developing the new Home Energy Auditing Standard.

3. Participating in codes and standards development for ASHRAE, ASTM, EPA and CGSB as committee member/vice chair/task group leader for standards on moisture control, air leakage of HVAC equipment, performance of thermal distribution system, Standard 62.2 on residential ventilation, duct tape performance, envelope air leakage, duct air leakage, whole house performance, HRV performance, and blower performance. Edited chapters of ASHRAE Handbook of Fundamentals and currently a member of the Research Administration Committee overseeing several million dollars a year of ASHRAE funded research.

4. Providing industry leadership through work on building performance standards for BPI, ASHRAE, the U.S. EPA and the state of California (PIER/Title 24).

5. Speaking and participating at ACI, EEBA, RESNET, BETEC and other professional societies and their meetings; member of the Consortium for Energy Efficiency: HVAC, Whole House and Thermostat committees.

Matt Golden, President and Founder, Recurve

Education and Training

Georgetown University, B.A., Foreign Relation, 1997

Research and Professional Experience

Sustainable Spaces, Founder & President, 2004 - Present

- Developed the concept for Sustainable Spaces to meet this market demand by providing a single full-service resource and a brand homeowners can trust to help them improve the comfort, health, and efficiency of their home.

Efficiency First, President, 2008 - Preset

- Matt spearheaded the formation of Efficiency First, a national organization representing America's home performance workforce that is dedicated to retrofitting America's homes, building the industry infrastructure to create jobs, and reducing energy consumption, carbon emissions, and dependence on foreign oil.

Sun Power & Geothermal Energy, Energy Consultant, 2003 – 2004

- Worked as an energy consultant helping homeowners and businesses develop solar power systems.

Synergistic Activities

- Matt currently resides on the following boards: Department of Energy (DOE) Home Performance Council,
- Building Performance Institute (BPI), California Building Performance Contractors Association (CBPCA)
- Build It Green, and Fine Home Building Magazine Green Building Advisory Board.

Kathleen Carrie Armel, Precourt Institute for Energy Efficiency, Stanford University

Education and Training

University of California, San Diego, Joint degree in Psychology and Cognitive Science, Concentration in Neuroscience, Ph.D., 10/03
University of California, San Diego, M.A., 1997
North Carolina State University, Raleigh, Psychology B.A., Pre-Medicine concentration & Cognitive Science minor,1995
Precourt Institute at Stanford University, Grant from the, for developing a website, literature database, and review paper. ($63,000) 2007
University of California President's Dissertation Fellowship, 2001-2
Summer Institute in Cognitive Neuroscience, Dartmouth, 2000
Graduate Student Travel & Subject Payment Grants, UCSD, 1999, 2000

Research and Professional Experience

Precourt Institute for Energy Efficiency, Research Associate, 7/08-Current
Stanford Prevention Research Center, Postdoctoral Fellow, Stanford University, 1/07-6/08
Stanford University Economics Department, Postdoctoral Fellow, 2004-2006
Beth Israel Hospital, Research Assistant, 1995-1996
Time Estimation in Amnesic and Frontal Patients
NCSU, Honors Thesis, Mechanisms Underlying Visual Imagery, 1994-1995
NCSU, Research Assistant, Nutritional Support by Neuronal Glial Cells, 1994

Publications

Armel, K. C. (in preparation). Behavior and energy: A solutions-oriented approach on how an understanding of behavior can help address climate change and energy insecurity.

Armel, K. C. (in preparation, invited by Environmental Law Review). Estimating greenhouse gas emissions for individual behaviors.

Armel, K. C., Yan, K., & Robinson, T. N. (submitted to Climatic Change). Validation of the Stanford Climate Change Behavior (SCCB) Survey: Assessing greenhouse gas emissions-related behaviors in individuals and populations.

Ian Karjbich, I., Armel, C., & Rangel, A. (in preparation). Visual attention drives the construction and comparison of values in simple economic choice.

Chiba, A. A. and Armel, K. C. (in preparation). Neural underpinnings of the mere exposure effect.

Balogh, J., Armel, C., & Cohen, M.H. (submitted). Preference for rapid reprompt as an error recovery strategy.

Armel, K. C., Pulido, C., Wixted, J., Chiba, A. (accepted at Learning and Motivation). Forming preferences: Behavioral, facial electromyography, and preferential looking findings.

Armel, K. C., Beaumel, A., & Rangel, A. (2008). Biasing simple choices by manipulating relative visual attention. *Judgment and Decision Making*, 3, 396–403.

Armel, K. C. & Rangel, A. (2008). The impact of computation time and experience on decision values. *American Economic Review,* 98, 163-68.

Armel, K. C. & Ramachandran, V. S. (2003). Projecting sensations to external objects: Evidence from skin conductance response. *Proceedings of the Royal Society of London: Biological, 270,* 1499-1506.

Armel, K. C. & Ramachandran, V. S. (1999). Acquired synesthesia in retinitis pigmentosa. *Neurocase: Case Studies in Neuropsychology, Neuropsychiatry, & Behavioural Neurology, 5* (4), 293-296.

Ramachandran, V. S., Armel, C., Foster, C., Stoddard, R. (1998). Object recognition can drive motion perception. *Nature, 395* (6705), 852-853.

Armel, K. C. (working paper). Characteristics and neural underpinnings of stimulus-specific predispositions (a review). (Regarding 'hard-wired' responses to affective cues.)

Armel, C., Donnelly, K., Mokriam, P. (in preparation). Reducing energy demand through electricity measurement and feedback technologies. *Precourt Institute for Energy Efficiency White Paper*, Stanford University, Stanford, CA.

Balogh, J., Armel, C., and Cohen M. H. (2000). Preference for rapid reprompt as an error recovery strategy. Internal Nuance publication.

Synergistic Activities

1. Ad-Hoc Reviewer for: Climatic Change, American Economic Review, Neurocase, Psychophysiology
2. Member of: Society for Neuroeconomics, Society for Neuroscience, Cognitive Neuroscience Society, Society for Psychophysiological Research
3. 2008 Chair of the "Electricity Use, Measurement, and Feedback Workshop" (Stanford, CA)
4. 2008 Invited expert on electricity measurement technologies at the American Gas Association Board Meeting, San Diego, CA
5. 2008 Invited expert to the Department of Energy workshop on "Behavior and Residential Energy Use"
6. 2008 Co-chair for the 2nd national "Behavior, Energy, and Climate Change Conference" (Sacramento, CA)
7. 2007 Co-chair for the 1st national "Behavior, Energy, and Climate Change Conference" in Sacramento, CA (and moderator for the sessions "Building on Experience: What We Can Learn From Entertainment & Other Fields" and "Quantifying Behavior and its Impact")
8. 2007 Developed the Precourt Institute for Energy Efficiency's "Behavior and Energy" website and database

THOMAS N. ROBINSON, MD, MPH is the Irving Schulman, MD Endowed Professor in Child Health, Professor of Pediatrics and of Medicine and CHP/PCOR Associate, in the Division of General Pediatrics and the Stanford Prevention Research Center at Stanford University School of Medicine, and Director of the Center for Healthy Weight at Stanford University and Lucile Packard Children's Hospital at Stanford

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Education and Training

Stanford University, B.S., M.D.
University of California, Berkeley M.P.H. in Maternal and Child Health He completed his Boston and Harvard Medical School, Internship and residency in Pediatrics at Children's Hospital
Stanford University, Robert Wood Johnson Clinical Scholar.,post-doctoral training
Stanford, Associate Professor, 2003
Stanford, Associate Professor, 1996
Stanford, joined faculty, 1993

Publications

"Does Children's Screen Time Predict Requests for Advertised Products? Cross-Sectional and Prospective Analyses," LJ Chamberlain, Y Wang, Thomas N. Robinson, *Archives of Pediatrics & Adolescent Medicine* vol. 160, 4 (2006).
"Are Certain Multicenter Randomized Clinical Trial Structures Misleading Clinical and Policy Decisions?" HC Kraemer, Thomas N. Robinson, *Contemporary Clinical Trials* vol. 26, 5 (2005).
"Preventing Childhood Obesity: A Solution-Oriented Research Paradigm," Thomas N. Robinson, JR Sirard, *American Journal of Preventive Medicine* vol. 28, 2 Suppl 2 (2005).
"Major Depression Among Adolescent Smokers Undergoing Treatment for Nicotine Dependence," JD Killen, Thomas N. Robinson, S Ammerman, C Hayward, J Rogers, D Samuels, AF Schatzberg, *Psychology of Addictive Behaviors* vol. 29, 8 (2004).
"Children's Food Consumption During Television Viewing," DM Matheson, JD Killen, Y Wang, A Varady, Thomas N. Robinson, *American Journal of Clinical Nutrition* vol. 79, 6 (2004).
"Assessing Weight-Related Biochemical Cardiovascular Risk Factors in African-American Girls," DM Wilson, Y Wang, KW Cullen, T Baranowski, JH Himes, M Gross, BS McClanahan, Thomas N. Robinson, *Obesity Research* vol. 12, Suppl (2004).
"Randomized Clinical Trial of the Efficacy of Bupropion Combined with Nicotine Patch in the Treatment of Adolescent Smokers," JD Killen, Thomas N. Robinson, S Ammerman, C Hayward, J Rogers, C Stone, D Samuels, SK Levin, S Green, AF Schatzberg, *Journal of Consulting and Clinical Psychology* vol. 72, 4 (2004).
"Effectiveness of a Multicomponent Self-Management Program in At-Risk, School-Aged Children with Asthma," RS Shames, P Sharek, M Mayer, Thomas N. Robinson,

EG Hoyte, F Gonzalez-Hensley, David Bergman, DT Umetsu, *Annals of Allergy, Asthma & Immunology* vol. 92, 6 (2004).
"Effects of a Videotape to Increase Use of Poison Control Centers by Low-Income and Spanish-Speaking Families: A Randomized, Controlled Trial," NR Kelly, LC Huffman, FS Mendoza, Thomas N. Robinson, *Pediatrics* vol. 111, 1 (2003).
"Dance and Reducing Television Viewing to Prevent Weight Gain in African-American Girls: The Stanford GEMS Pilot Study," Thomas N. Robinson, JD Killen, HC Kraemer, DM Wilson, DM Matheson, WL Haskell, LA Pruitt, TM Powell, AS Owens, Nikko S. Thompson, NM Flint-Moore NM Flint-Moore, GJ Davis GJ Davis, KA Emig, RT Brown, J Rochon, S Green, A Varady, *Ethnicity & Disease* vol. 13, 1 Suppl 1 (2003).
"Agreement Among Measures of Asthma Status: A Prospective Study of Low-Income Children with Moderate to Severe Asthma," PJ Sharek, ML Mayer, L Loewy, Thomas N. Robinson, RS Shames, DT Umetsu, David Bergman, *Pediatrics* vol. 110, 4 (2002).
"The 30-Second Effect: An Experiment Revealing the Impact of Television Commercials on Food Preferences of Preschoolers," DL Borzekowski, Thomas N. Robinson, *Journal of the American Dietetic Association* vol. 101, 1 (2001).
"Effects of Reducing Children's Television and Video Game Use on Aggressive Behavior: A Randomized Controlled Trial,"Thomas N. Robinson, ML Wilde, LC Navracruz, KF Haydel, A Varady, *Archives of Pediatrics & Adolescent Medicine* vol. 155 (2001).
"Are Perceived Neighborhood Hazards a Barrier to Physical Activity in Children?" AJ Romero, Thomas N. Robinson, HC Kraemer, SJ Erickson, KF Haydel, Fernando S. Mendoza, J Killen, *Archives of Pediatrics & Adolescent Medicine* vol. 155 (2001).
"Evidence-Based Approach to Interactive Health Communication: A Challenge to Medicine in the Information Age," Thomas N. Robinson, K. Patrick, T.R. Eng, D. Gustafson, *Journal of the American Medical Association* vol. 280 (1998).
"Television and Music Video Exposure and Risk of Adolescent Alcohol Use," Thomas N. Robinson, H.L Chen, J.D. Killen, *Pediatrics* vol. 102, 5 (1998).
"Do Cigarette Warning Labels Reduce Smoking? Paradoxical Effects among Adolescents," Thomas N. Robinson, J.D. Killen, *Archives of Pediatrics & Adolescent Medicine* vol. 151 (1997).

Synergistic Activities

1. Robert Wood Johnson Foundation Generalist Physician Faculty Scholar, was a member of the Institute of Medicine's Committees on Prevention of Obesity in Children and Adolescents and Progress in Preventing Childhood Obesity, and is Principal Investigator on numerous prevention studies funded by the National Institutes of Health.
2. Board Certified in Pediatrics, a fellow of the American Academy of Pediatrics, and practices General Pediatrics at Lucile Packard Children's Hospital at Stanford.

Project Title: *Retrofit California*
Name of Applicant: Los Angeles County
Project Director: Howard Choy

Los Angeles County has joined with the Association of Bay Area Governments (ABAG), the California Center for Sustainable Energy (CCSE), and Sacramento Municipal Utility District (SMUD), along with the California Energy Commission, Air Resources Board, and a broad-based and highly qualified team of public and private partners, to present this proposal. Our *Retrofit California* program will rapidly accelerate building energy retrofits across the state and achieve deep market penetration in focused geographic areas. *Retrofit California* will enable California to demonstrate innovative and impactful program models that are highly transferrable, both statewide and nationally.

Retrofit California has identified a set of three core program objectives that address the major barriers to market transformation and guide program design.

1. Provide attractive new financing options to address the high upfront cost of retrofits.

2. Demonstrate more effective marketing and outreach methods to inform and motivate property owner participation.

3. Streamline participant, contractor, and administration processes to reduce the high transaction costs created by an inefficient delivery model.

The following *Retrofit California* program innovations are consistent with program objectives and will remove primary market barriers:

Financing Innovations:

- Promotion of Property Assessed Clean Energy (PACE) financing
- Providing revolving loans or "on-bill" financing for measures PACE cannot finance
- Energy efficiency utility allowances for affordable housing

Marketing and Outreach Innovations:

- Retail home improvement and HVAC service provider partnerships
- Community-based social marketing through existing channels (e.g. schools, faith based communities, employers)
- High Performance Building Labeling
- Bundle all relevant information and incentives and deliver it through trusted sources

Project Delivery Innovations:

- Whole neighborhood retrofits
- Advanced project and program management software to streamline delivery
- Bulk purchase programs for equipment and services

Retrofit California will leverage $529 million in private investment, utility incentives, and other stimulus funds to produce a proven turn-key approach to market transformation that can be sustained with minor ongoing cost and readily applied to regions throughout the U.S. The program will gather a robust set of data on energy savings, retrofit rates of return, and participant characteristics. This data will be used to evaluate and adapt programs to ensure success. At the close of the three-year program term, *Retrofit California* will create or retain 6,561 jobs, achieve reductions in annual purchased energy consumption of an aggregate 947,050 source BTUs and $18,048,048 as well as a permanent reduction of 44,543 metric tons CO2e annually.

PMC123.1 - Budget Justification for SF 424A Budget

Instructions and Summary

Award Number: _____ **Date of Submission:** _____

Award Recipient: California Center for Sustainable **Form submitted by:** _____

(May be award recipient or sub-recipient)

Please read the instructions on each page before starting.
If you have any questions, please ask your DOE contact. It will save you time!

On this form, provide detailed support for the estimated project costs identified on the SF-424A form (Budget).

- The dollar amounts on this page must match the amounts on the associated SF-424A.
- The award recipient and each sub-recipient with estimated costs of $100,000 or more must complete this form and a SF-424A form.
- The total budget presented on this form and on the SF424A must include both Federal (DOE), and Non-Federal (cost share) portions, thereby reflecting TOTAL PROJECT COSTS proposed.
- For costs in each Object Class Category on the SF-424A, complete the corresponding worksheet on this form (tab at the bottom of the page).
- All costs incurred by the preparer's sub-recipients, vendors, contractors, consultants and Federal Research and Development Centers (FFRDCs), should be entered only in section f. Contractual. All other sections are for the costs of the preparer only.

SUMMARY OF BUDGET CATEGORY COSTS PROPOSED

(Note: The values in this summary table are from entries made in each budget category sheet.)

CATEGORY	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Total Costs	Project Costs %	Comments (Add comments as needed)
a. Personnel	$277,515	$264,762	$264,762	**$807,039**	**8.0%**	
b. Fringe Benefits	$113,781	$108,553	$108,553	**$330,886**	**3.3%**	
c. Travel	$6,960	$6,960	$6,960	**$20,880**	**0.2%**	
d. Equipment	$0	$0	$0	**$0**	**0.0%**	
e. Supplies	$155,250	$132,750	$110,250	**$398,250**	**3.9%**	
f. Contractual						
Sub-recipient	*$0*	*$0*	*$0*	*$0*	*0.0%*	
FFRDC	*$0*	*$0*	*$0*	*$0*	*0.0%*	
Vendor	*$1,245,815*	*$1,086,368*	*$1,018,883*	*$3,351,066*	*33.1%*	
Total Contractual	$1,245,815	$1,086,368	$1,018,883	**$3,351,066**	**33.1%**	
g. Construction	$0	$0	$0	**$0**	**0.0%**	
h. Other Direct Costs	$2,109,750	$1,663,000	$316,250	**$4,089,000**	**40.4%**	
i. Indirect Charges	$387,383	$369,582	$369,582	**$1,126,546**	**11.1%**	
Total Project Costs	**$4,296,454**	**$3,631,974**	**$2,195,240**	**$10,123,668**	**100.0%**	

Additional Explanations/Comments (as necessary)

a. Personnel

PLEASE READ!!!

List costs solely for employees of the entity completing this form (award recipient or sub-recipient). All other personnel costs (of subrecipients or other contractual efforts of the entity preparing this) must be included under f., Contractual. This includes all consultants and FFRDCs.

Identify positions to be supported. Key personnel should be identified by title. All other personnel should be identified either by title or a group category. State the amounts of time (e.g., hours or % of time) to be expended, the composite base pay rate, total direct personnel compensation and identify the rate basis (e.g., actual salary, labor distribution report, technical estimate, state civil service rates, etc.).

Add rows as needed. Formulas/calculations will need to be entered by the preparer of this form. Please enter formulas as shown in the example.

Task # and Title	Position Title	Budget Period 1			Budget Period 2			Budget Period 3			Project Total Hours	Project Total Dollars	Rate Basis
		Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 1	Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 2	Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 3			
1. Generation 2A Receiver Design		10000		$423,000	600		$24,000	800		$31,000	11400	$478,000	Actual Salary
EXAMPLE	Sr. Engineer	2000	$85.00	$170,000	200	$50.00	$10,000	200	$50.00	$10,000	2400	$190,000	Actual Salary
ONLY!!!	Electrical engineers	6200	$35.00	$217,000	400	$35.00	$14,000	600	$35.00	$21,000	7200	$252,000	Actual Salary
	Technician	1800	$20.00	$36,000	0	$0.00	$0	0	$0.00	$0	1800	$36,000	Actual Salary
California Center for Sustainable Energy													
	Director of Programs	208	$62.37	$12,973	104	$62.37	$6,486	104	$62.37	$6,486	416	$25,945	Actual Salary
	Local Government Liaison	208	$29.72	$6,182	208	$29.72	$6,182	208	$29.72	$6,182	624	$18,545	Actual Salary
	Program Associate	2080	$24.23	$50,408	2080	$24.23	$50,408	2080	$24.23	$50,408	6240	$151,224	Actual Salary
	Director of Education and	208	$44.55	$9,266	104	$44.55	$4,633	104	$44.55	$4,633	416	$18,532	Actual Salary
	Program Analyst	126	$26.92	$3,392	208	$26.92	$5,600	208	$26.92	$5,600	542	$14,592	Actual Salary
	Web Developer	312	$38.85	$12,120	312	$38.85	$12,120	312	$38.85	$12,120	936	$36,361	Actual Salary
	Senior Analyst	104	$31.36	$3,262	104	$31.36	$3,262	104	$31.36	$3,262	312	$9,785	Actual Salary
	Marketing Manager	104	$36.71	$3,818	65	$36.71	$2,386	65	$36.71	$2,386	234	$8,590	Actual Salary
	Marketing Specialist	104	$22.45	$2,335	104	$22.45	$2,335	104	$22.45	$2,335	312	$7,005	Actual Salary
	Marketing Assistant	104	$19.96	$2,076	104	$19.96	$2,076	104	$19.96	$2,076	312	$6,227	Actual Salary
	Copy Writer	208	$23.17	$4,818	104	$23.17	$2,409	104	$23.17	$2,409	416	$9,637	Actual Salary
	Associate Special Events	104	$19.96	$2,076	104	$19.96	$2,076	104	$19.96	$2,076	312	$6,227	Actual Salary
	Controller	104	$54.00	$5,616	104	$54.00	$5,616	104	$54.00	$5,616	312	$16,848	Actual Salary
	Staff Accountant	104	$27.58	$2,868	104	$27.58	$2,868	104	$27.58	$2,868	312	$8,605	Actual Salary
	Engineering Manager	1040	$36.06	$37,502	1040	$36.06	$37,502	1040	$36.06	$37,502	3120	$112,507	Actual Salary
	Special Events	104	$29.94	$3,113	104	$29.94	$3,113	104	$29.94	$3,113	312	$9,340	Actual Salary
	Online Community Specialist	2080	$22.45	$46,696	2080	$22.45	$46,696	2080	$22.45	$46,696	6240	$140,088	Actual Salary
	Program Manager	2080	$33.17	$68,994	2080	$33.17	$68,994	2080	$33.17	$68,994	6240	$206,981	Actual Salary
	Total Personnel Costs	9382		$277,515	11193		$264,762	11193		$264,762	0	$807,039	

Additional Explanations/Comments (as necessary)

b. Fringe Benefits

	Budget Period 1	Budget Period 2	Budget Period 3	Total
Rate applied:	41.0%	41.0%	41.0%	
Total fringe requested:	$113,781	$108,553	$108,553	**$330,886**

A federally approved fringe benefit rate agreement, or a proposed rate supported and agreed upon by DOE for estimating purposes is required if reimbursement for fringe benefits is requested. Please check (X) one of the options below and provide the requested information, if it has not already been provided to the Contracting Officer, OR if it has changed since it was. Calculate the fringe rate and enter the total amount in Section B, line 6.b. ("Fringe Benefits") of form SF-424A.

____ **A fringe benefit rate has been negotiated with, or approved by, a federal government agency. A copy of the latest rate agreement is included with this application, and will be provided electronically to the Contracting Officer for this project.**
(When this option is selected, a presentation of the budget that demonstrates the appliction of the approved rate, to arrive at the proposed fringes benefits dollars should also be provided.)

√ **There is not a current, federally approved rate agreement negotiated and available.**
(When this option is checked, the entity preparing this form shall submit a rate proposal in the format provided at the following website, or a format that provides the same level of information and which will support the rates being proposed for use in performance of the proposed project. Go to https://www.eere-pmc.energy.gov/forms.aspx and select PMC 400.2 Sample Rate Proposal.)

Additional explanation/comments (as necessary)

c. Travel

PLEASE READ!!!

Provide travel detail as requested below, identifying total Foreign and Domestic Travel as separate items. Purpose of travel are items such as professional conference, DOE sponsored meeting, project management meeting, etc. The Basis for Estimating Costs are items such as past trips, current quotations, Federal Travel Regulations, etc.

All listed travel must be necessary for performance of the Statement of Projecct Objectives.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

Purpose of travel	No. of Travelers	Depart From (not required for domestic travel)	Destination (not required for domestic travel)	No. of Days	Cost per Traveler	Cost per Trip	Basis for Estimating Costs
Budget Period 1							
Domestic Travel							
EXAMPLE ONLY!!! Visit to PV cell mfr. to set up vendor agreement	2			2	$650	$1,300	Internet prices
Quarterly team meeting in LA	3	San Diego	Los Angeles	2	$470	$1,410	$70 mileage, $150 hotel (2 nights), $50 per diem (2 days)
Quarterly team meeting in LA	3	San Diego	Los Angeles	2	$470	$1,410	$70 mileage, $150 hotel (2 nights), $50
Quarterly team meeting in LA	3	San Diego	Los Angeles	2	$470	$1,410	$70 mileage, $150 hotel (2 nights), $50
Quarterly team meeting in LA	3	San Diego	Los Angeles	2	$470	$1,410	$70 mileage, $150 hotel (2 nights), $50
Local travel	1			24	$1,320	$1,320	200 miles per month, 12 months, @
						$0	
						$0	
						$0	
Domestic Travel subtotal						$6,960	
International Travel							
						$0	
						$0	
						$0	
						$0	
International Travel subtotal						$0	
Budget Period 1 Total						**$6,960**	
Budget Period 2							
Domestic Travel							
Quarterly team meeting in LA	3	San Diego	Los Angeles	2	$470	$1,410	$70 mileage, $150 hotel (2 nights), $50
Quarterly team meeting in LA	3	San Diego	Los Angeles	2	$470	$1,410	$70 mileage, $150 hotel (2 nights), $50 per diem (2 days)
Quarterly team meeting in LA	3	San Diego	Los Angeles	2	$470	$1,410	$70 mileage, $150 hotel (2 nights), $50
Quarterly team meeting in LA	3	San Diego	Los Angeles	2	$470	$1,410	$70 mileage, $150 hotel (2 nights), $50
Local travel	1			24	$1,320	$1,320	200 miles per month, 12 months, @

Purpose of travel	No. of Travelers	Depart From (not required for domestic travel)	Destination (not required for domestic travel)	No. of Days	Cost per Traveler	Cost per Trip	Basis for Estimating Costs
Domestic Travel subtotal						$6,960	
International Travel							
International Travel subtotal						$0	
Budget Period 2 Total						**$6,960**	
Budget Period 3							
Domestic Travel							
Quarterly team meeting in LA	3	San Diego	Los Angeles	2	$470	$1,410	$70 mileage, $150 hotel (2 nights), $50
Quarterly team meeting in LA	3	San Diego	Los Angeles	2	$470	$1,410	$70 mileage, $150 hotel (2 nights), $50
Quarterly team meeting in LA	3	San Diego	Los Angeles	2	$470	$1,410	$70 mileage, $150 hotel (2 nights), $50
Quarterly team meeting in LA	3	San Diego	Los Angeles	2	$470	$1,410	$70 mileage, $150 hotel (2 nights), $50
Local travel	1			24	$1,320	$1,320	200 miles per month, 12 months, @
						$0	
						$0	
Domestic Travel subtotal						$6,960	
International Travel							
						$0	
						$0	
						$0	
						$0	
International Travel subtotal						$0	
Budget Period 3 Total						**$6,960**	
PROJECT TOTAL						**$20,880**	

Additional Explanations/Comments (as necessary)

d. Equipment

PLEASE READ!!!

Equipment is generally defined as an item with an acquisition cost greater than $5,000 and a useful life expectancy of more than one year. Further definitions can be found at 10 CFR 600 found on the PMC Recipient Resources Forms page at https://www.eere-pmc.energy.gov/Forms.aspx#regs .

List all proposed equipment below, providing a basis of cost such as vendor quotes, catalog prices, prior invoices, etc., and briefly justifying its need as it applies to the Statement of Project Objectives. If it is existing equipment, and the value of its contribution to the project budget is being shown as cost share, provide logical support for the estimated value shown. If it is new equipment which will retain a useful life upon completion of the project, provide logical support for the estimated value shown.

For equipment over $50,000 in price, also include a copy of the associated vendor quote or catalog price list.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

Equipment Item	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
Budget Period 1					
EXAMPLE ONLY!!! Thermal shock chamber	2	$20,000	$40,000	Vendor Quote	Reliability testing of PV modules- Task 4.3
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
Budget Period 1 Total			$0		
Budget Period 2					
			$0		
			$0		
			$0		
			$0		
Budget Period 2 Total			$0		

e. Supplies

PLEASE READ!!!

Supplies are generally defined as an item with an acquisition cost of $5,000 or less and a useful life expectancy of less than one year. Supplies are generally consumed during the project performance. Further definitions can be found at 10 CFR 600 found on the PMC Recipient Resources Forms page at https://www.eere-pmc.energy.gov/Forms.aspx#regs.

List all proposed supplies below, providing a bases of cost such as vendor quotes, catalog prices, prior invoices, etc., and briefly justifying the need for the Supplies as they apply to the Statement of Project Objectives. Note that Supply items must be direct costs to the project at this budget category, and not duplicative of supply costs included in the indirect pool that is the basis of the indirect rate applied for this project.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

General Category of Supplies	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
Budget Period 1					
EXAMPLE ONLY!!! Wireless DAS components	10	$360.00	$3,600	Catalog price	For Alpha prototype - Task 2.4
GIS Data	2	$7,500.00	$15,000		
Comm real estate data	12	$2,000.00	$24,000		
Consumer (residential) collateral	60000	$1.50	$90,000		
Contractor collateral	10000	$1.50	$15,000		
Commercial collateral	7500	$1.50	$11,250		
			$0		
			$0		
			$0		
			$0		
			$0		
Budget Period 1 Total			**$155,250**		
Budget Period 2					
GIS Data	1	$7,500.00	$7,500		
Comm real estate data	12	$2,000.00	$24,000		
Marketing collateral	50000	$1.50	$75,000		
Contractor collateral	10000	$1.50	$15,000		
Commercial colalteral	7500	$1.50	$11,250		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
Budget Period 2 Total			$132,750		

General Category of Supplies	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
Budget Period 3					
Comm real estate data	12	$2,000.00	$24,000		
GIS Data	1	$7,500.00	$7,500		
Marketing collateral	40000	$1.50	$60,000		
Contractor collateral	7500	$1.50	$11,250		
Commercial collateral	5000	$1.50	$7,500		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
Budget Period 3 Total			$110,250		
PROJECT TOTAL			**$398,250**		

Additional Explanations/Comments (as necessary)

f. Contractual

PLEASE READ!!!

The entity completing this form must provide all costs related to sub-recipients, vendors, contractors, consultants and FFRDC partners in the applicable boxes below.

Sub-recipients (partners, sub-awardees):

For each sub-recipient with total project costs of $100,000 or more, a separate SF-424A budget and PMC123.1 budget justification form must be submitted. These sub-recipient forms may be completed by either the sub-recipients themselves or by the preparer of this form. The budget totals on the sub-recipient's forms must match the sub-recipeint entries below.

The preparer of this form need only provide further support of the completed sub-recipient budget forms as they deem necessary. The support to justify the budgets of sub-recipients with estimated costs less than $100,000 may be in any format, and at a minimum should provide what Statement of Project Objectives task(s) are being performed, the purpose/need for the effort, and a basis of the estimated costs that is considered sufficient for DOE evaluation.

Vendors (includes contractors and consultants):

List all vendors, contractors and consultants supplying commercial supplies or services used to support the project. The support to justify vendor costs (in any amount) should provide the purpose for the products or services and a basis of the estimated costs that is considered sufficient for DOE evaluation.

Federal Research and Development Centers (FFRDCs):

For FFRDC partners, award recipient will provide a Field Work Proposal (if not already provided with the original application), along with the FFRDC labor mix and hours, by category and FFRDC major purchases greater than $25,000, including Quantity, Unit Cost, Basis of Cost, and Justification. The award recipient may allow the FFRDC to provide this information directly to DOE.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

Sub-Recipient Name/Organization	Purpose/Tasks in SOPO	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Project Total
EXAMPLE ONLY!!! XYZ Corp.	Partner to develop optimal fresnel lens for Gen 2 product - Task 2.4	$48,000	$32,000	$16,000	$96,000
					$0
					$0
					$0
					$0
					$0

Sub-Recipient Name/Organization	Purpose/Tasks in SOPO	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Project Total
					$0
					$0
					$0
	Sub-total	$0	$0	$0	$0

Vendor Name/Organization	Product or Service, Purpose/Need and Basis of Cost (Provide additional support at bottom of page as needed)	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Project Total
EXAMPLE ONLY!!! ABC Corp.	Vendor for developing custom robotics to perform lens inspection, alignment, and placement (Task 4). Required for expanding CPV module mfg. capacity. Cost is from competitive quotes.	$32,900	$86,500		**$119,400**
TBD	Residential marketing and outreach	$216,000	$238,804	$204,000	**$658,804**
City and County of San Diego, City of Chula Vista, SANDAG	Public sector program support	$210,000	$150,000	$150,000	**$510,000**
TBD	Development of website platform and assoicated interactive tools	$100,000			**$100,000**
TBD	Low/Mod Income program	$200,000	$200,000	$100,000	**$500,000**
TBD	Commercial Outreach & Auditing Support	$216,000	$216,000	$144,000	**$576,000**
TBD	Multifamily outreach and technical support	$239,313	$239,313	$205,125	**$683,750**
TBD	EM&V	$54,502	$27,251	$190,758	**$272,512**
SDSU	Analysis of consumer behavior related to web-enabled online community pilot	$10,000	$15,000	$25,000	**$50,000**
		$1,245,815	**$1,086,368**	**$1,018,883**	**$3,351,066**

g. Construction

PLEASE READ!!!

Construction, for the purpose of budgeting, is defined as all types of work done on a particular building, including erecting, altering, or remodeling. Construction conducted by the award recipient is entered on this page. Any construction work that is performed by a vendor or subrecipient to the award recipient should be entered under f. Contractual.

List all proposed construction below, providing a basis of cost such as engineering estimates, prior construction, etc., and briefly justify its need as it applies to the Statement of Project Objectives.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

Overall description of construction actiivities:

Example Only!!! - Build wind turbine platform

General Description	Cost	Basis of Cost	Justification of need
Budget Period 1			
Three days of excavation for platform site EXAMPLE ONLY!!!	$28,000	Engineering estimate	Site must be prepared for construction of platform.
Budget Period 1 Total	$0		
Budget Period 2			
Budget Period 2 Total	$0		
Budget Period 3			

h. Other Direct Costs

PLEASE READ!!!

Other direct costs are direct cost items required for the project which do not fit clearly into other categories, and are not included in the indirect pool for which the indirect rate is being applied to this project. Examples are meeting costs, postage, couriers or express mail, telephone/fax costs, printing costs, etc.

Basis of cost are items such as vendor quotes, prior purchases of similar or like items, published price list, etc.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

General description	Cost	Basis of Cost	Justification of need
		Budget Period 1	
EXAMPLE ONLY!!! Grad student tuition	$16,000	Established UCD costs	Support of graduate students working on project
Rebate Fund - Res	$1,200,000	1200 housing units@ $1000 each	
HERS support fund	$600,000	1200 HERS ratings @$500 each	
Rebate Fund - Comm	$125,000	$0.50/square foot for 250,000 sq feet	
Incentives for GreenPoint Rated multifamily retrofits	$84,750	75 housing units @ $465 each; 75 housing units @ $665 each	Offset investment costs of building energy retrofits and green labeling
Green Affordable Housing Retrofit Fund	$100,000	80 housing units @ $1250 each	25% public financing to attract private capital to affordable housing energy efficient retrofit projects
Budget Period 1 Total	$2,109,750		
		Budget Period 2	
Rebate Fund	$800,000	800 housing units@$1000 each	
HERS support fund	$400,000	800 HERS ratings @$500 each	
Rebate Fund - Comm	$250,000	$0.50/square foot for 500,000 sq feet	
Incentives for GreenPoint Rated multifamily retrofits	$113,000	100 housing units @ $465 each; 100	Offset investment costs of building energy retrofits and green labeling
Green Affordable Housing Retrofit Fund	$100,000	80 housing units @ $1250 each	25% public financing to attract private capital to affordable housing energy
Budget Period 2 Total	$1,663,000		
		Budget Period 3	
Rebate Fund - Comm	$125,000	$0.50/square foot for 250,000 sq feet	
Incentives for GreenPoint Rated multifamily retrofits	$141,250	125 housing units @ $465 each; 125 housing units @ $665 each	Offset investment costs of building energy retrofits and green labeling
Green Affordable Housing Retrofit Fund	$50,000	40 housing units @ $1250 each	25% public financing to attract private capital to affordable housing energy efficient retrofit projects
Budget Period 3 Total	$316,250		
PROJECT TOTAL	**$4,089,000**		

Additional Explanations/Comments (as necessary)

General description	Cost	Basis of Cost	Justification of need

h. Other Direct Costs

i. Indirect Costs

	Budget Period 1	Budget Period 2	Budget Period 3	Total
Rate applied:	99.0%	99.0%	99.0%	
Total indirect costs requested:	$387,383	$369,582	$369,582	**$1,126,546**

A federally approved indirect rate agreement, or rate proposed supported and agreed upon by DOE for estimating purposes is required if reimbursement of fringe benfits is requested. Please check (X) one of the options below and provide the requested information if it has not already been proved as requested, or has changed. Calculate the indirect rate dollars and enter the total in the Section B., line 6.j. (Indirect Charges) of form SF 424A.

_____ **There is a federally approved indirect rate agreement. A copy is provided with this application and will be provided electronically to the Contracting Officer for this project.**
(When this option is selected, a presentation of the budget that demonstrates the application of the approved rate, to arrive at the proposed indirect charges proposed should also be provided.)

x **There is no current, federally-approved indirect rate agreement.**
(When this option is checked, the entity preparing this form shall submit an indirect cost rate proposal in the format provided at the following website, or in a format that provides the same level of information and which supports the rate(s) being proposed for use in estimating the project. Go to https://www.eere-pmc.energy.gov/forms.aspx and select PMC 400.2 Sample Rate Proposal.)

Additional Explanations/Comments (as necessary)

SFPUC, the grantee, is similar in structure to the SF Dept. of Public Works whose Indirect Cost Plan has been approved by the U.S. Department of Transportation. A copy of that approved plan will be provided to the Contracting Officer upon assignment.

Cost Share

PLEASE READ!!!

A detailed presentation of the cash or cash value of all cost share proposed for the project must be provided in the table below. Identify the source & amount of each item of cost share proposed by the award recipient and each sub-recipient or vendor. **Letters of committment must be submitted for all third party cost share (other than award recipient).**

Note that "cost-share" is not limited to cash investment. Other items that may be assigned value in a budget as incurred as part of the project budget and necessary to performance of the project, may be considered as cost share, such as: contribution of services or property; donated, purchased or existing equipment; buildings or land; donated, purchased or existing supplies; and/or unrecovered personnel, fringe benefits and indirect costs, etc. For each cost share contribution identified as other than cash, identify the item and describe how the value of the cost share contribution was calculated.

Funds from other Federal sources MAY NOT be counted as cost share. This prohibition includes FFRDC sub-recipients. Non-Federal sources include private, state or local Government, or any source not originally derived from Federal funds. Documentation of cost sharing commitments must be provided, if not already provided with the original application and they have not changed since its submission.

Fee or profit will not be paid to the award recipients or subrecipients of financial assistance awards. Additionally, foregone fee or profit by the applicant shall not be considered cost sharing under any resulting award. Reimbursement of actual costs will only include those costs that are allowable and allocable to the project as determined in accordance with the applicable cost principles prescribed in 10 CFR 600.127, 10 CFR 600.222 or 10 CFR 600.317. Also see 10 CFR 600.318 relative to profit or fee.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

Organization/Source	Type (cash or other)	Cost Share Item	Budget Period 1 Cost Share	Budget Period 2 Cost Share	Budget Period 3 Cost Share	Total Project Cost Share
ABC Company EXAMPLE ONLY!!!	Cash	Project partner ABC Company will provide 40 PV modules for product development at 50% off the of the retail price of $680	$13,600			$13,600
						$0
						$0
						$0
						$0
						$0
						$0

Organization/Source	Type (cash or other)	Cost Share Item	Budget Period 1 Cost Share	Budget Period 2 Cost Share	Budget Period 3 Cost Share	Total Project Cost Share
						$0
						$0
						$0
						$0
		Totals	$0	$0	$0	$0

Total Project Cost: $10,123,668

Cost Share Percent of Award: 0.0%

Additional Explanations/Comments (as necessary)

CALIFORNIA CENTER FOR SUSTAINABLE ENERGY

YEAR 2009 OVERHEAD RATE

EXPENSES		DIRECT PROGRAM 2009-BUDGET	INDIRECT GENERAL ADMIN. 2009-BUDGET	2009 Percentage
Employee Expenses				
Salaries Net		1,574,740	883,899	39%
Fringe benefits & Taxes		560,643	466,411	21%
Total Employee Expenses		2,135,383	1,350,310	59%
Sponsorshisp, Donations & Misc Income		150,000		
Total EE Plus Grants		2,285,383		
Total Sub-Contractual Services		629,620	84,300	4%
Office & G&A Expenses		139,872	235,624	10%
Employee Dvelopment & Recruting		5,100	41,996	2%
Incentives/Rebates		20,054,000	-	0%
Corporate Insurance		-	17,880	1%
Information Technology		2,082	29,400	1%
Marketing		527,000	43,020	2%
Facilities (Rent & Opr Exp)	ERC	183,916	275,206	12%
Total Travel		38,160	30,695	1%
Equipment & Depreciation		79,600	163,049	7%
Office Relocation & Tenant Improvements			-	0%
Total Non Labor Expenses		21,659,350	921,170	41%
TOTAL BUDGET EXPENSES		***23,794,733***	*2,271,480*	
INDIRECT OVERHEAD RATE				
TOTAL INDIRECT OR G&A EXPENSES			2,271,480	
TOTAL DIRECT LABOR EXPENSES			2,285,383	
OVERHEAD RATE			**99%**	
Expected next 3 years			**103%**	

Notes:

Indirect Expenses are budgeted for year 2009 based on actual expenses incurred in fiscal year 2006 & 2007, and expected 2008-2009 higher cost due to new office space.

Indirect Salaries are calculated on employee hours incurred in general and administration duties, such as: Human Resources, Accounting, Receptionist, Executive Director and Business Development.

The rate was based on benefits allowed and provided by employer-employee agreements, or otherwise by law. Current Fringe Benefits Rate is 41%. (see fringe benefits attachment.)

Consulting Fees are paid and charged to General and Administration according to the nature and purpose of the expenditure.

Sub-contractual Fees are paid and charged to Programs according to the nature and purpose of the expenditure.

Office Supplies are allocated directly to General and Administration, and Program expenses are revised and charged directly to Programs.

Incentives/Rebates are charged strictily direct charges.

Corporate Insurance was considered in nature 100 as an Indirect Cost.

Marketing Indirect Expenses are very limited. The majority of these expenses are charged directly to Programs.

Rent is calculated at current 47% General and Administration, 30% ERC and 22% HDR (Subleased).

Travel is calculated and allocated according to the purpose of the trip.

Depreciation expenses is calculated based on equipment owned by SDREO (35%) and (65%) by the programs. Depreciation is not bill to programs.

CALIFORNIA CENTER FOR SUSTAINABLE ENERGY
YEAR 2009 FRINGE BENEFITS RATE

PROJECTED	Y-2009	%% On Total Benefits
VACATION	173,000	17%
SICK TIME USED	47,000	5%
HOLIDAYS	99,000	10%
	319,000	32%
TAXES -FICA	230,000	23%
403b	200,000	20%
MEDICAL/EMP ASIST & INS.	260,000	26%
	690,000	68%
TOTAL BENEFITS	1,009,000	100%
FRINGE BENEFIT RATES		
NET SALARIES	2,452,600	
FRINGE BENEFIT RATE	41%	

Notes:
Fringe Benefits are projected for year 2009 based on actual expenses incurred in fiscal year 2008, and expected increases for year 2009-10

The rate was based on benefits allowed and provided by employer-employee agreements, or otherwise by law.

Vacation, Sick and Holiday are calculated based on vacation hours earned by employees according to individual employer-employee agreement.

FICA & ER Taxes is calculated based on current rate.

403b is calculated based on current employees' salary. Employees are eligible to a 10% on their salaries after the sixth month of anniversity date.

Medical, Employee Assistance Programs and Insurance is calculated based on employer-employee agreement.

Applicant Name: Association of Bay Area Governments

Award Number: DE-FOA-0000148

Budget Information - Non Construction Programs

Section A - Budget Summary

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		
		Federal (c)	Non-Federal (d)	Federal (e)
1.				$6,999,575
2.				
3.				
4.				
5. Totals		$0	$0	$6,999,575

Section B - Budget Categories

6. Object Class Categories	Grant Program, Function or Activity		
	(1)	(2)	(3)
a. Personnel	$262,919		
b. Fringe Benefits	$160,380		
c. Travel	$14,400		
d. Equipment			
e. Supplies			
f. Contractual	$4,645,069		
g. Construction			
h. Other	$1,735,000		
i. Total Direct Charges (sum of 6a-6h)	$6,817,768	$0	$0
j. Indirect Charges	$181,807		
k. **Totals** (sum of 6i-6j)	$6,999,575	$0	$0
7. Program Income			

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Section C - Non-Federal Resources

(a) Grant Program	(b) Applicant	(c) State
8.		
9.		

10.			
11.			
12. **Total** (sum of lines 8 - 11)		$0	$0

Section D - Forecasted Cash Needs			
	Total for 1st Year	1st Quarter	2nd Quarter
13. Federal	$6,999,575	$1,749,894	$1,749,894
14. Non-Federal	$0		
15. **Total** (sum of lines 13 and 14)	$6,999,575	$1,749,894	$1,749,894

Section E - Budget Estimates of Federal Funds Needed for Balance of the Project		
		Future Fur
(a) Grant Program	(b) First	(c) Second
16.		
17.		
18.		
19.		
20. **Total** (sum of lines 16-19)	$0	$0

Section F - Other Budget Information	
21. Direct Charges	22. Indirect Charges
23. Remarks	

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Instructions for the SF-424A

Public Reporting Burden for this collection of information is estimated to average 3.0 hours per response, including the time for reviewing instr maintaining the data needed, and completing and reviewing the collection of information. Please do not return your completed form to the Offi provided by the sponsoring agency.

General Instructions

This form is designed so that application can be made for funds from one or more grant programs. In preparing the budget, adhere to any existing Federal grantor agency guidelines which prescribe how and whether budgeted amounts should be separately shown for different functions or activities within the program. For some programs, grantor agencies may require budgets to be separately shown by function or activity. For other programs, grantor agencies may require a breakdown by function or activity. Sections A, B, C, and D should include budget estimates for the whole project except when applying for assistance which requires Federal authorization in annual or other funding period increments. In the later case, Sections A, B, C, and D should provide the budget for the first budget period (usually a year) and Section E should present the need for Federal assistance in the subsequent budget periods. All applications should contain a breakdown by the object class categories shown in Lines a-k of Section B.

For continuing grant program a

each funding period as required b estimated amounts of funds whicl period only if the Federal grantor these columns blank. Enter in col upcoming period. The amount(s) i Columns (e) and (f).

For supplemental grants and cl

and (d). Enter in Column (e) the a and enter in Column (f) the amou Column (g) enter the new total bu includes the total previous authori the amounts shown in Columns (

Section A. Budget Summary Lines 1-4 Columns (a) and (b)
For applications pertaining to a **single** Federal grant program (Federal Domestic Assistance Catalog number) and **not requiring** a functional or activity breakdown, enter on Line 1 under Column (a) the catalog program title and the catalog number in Column (b).

For applications pertaining to a **single** program **requiring** budget amounts by multiple functions or activities, enter the name of each activity or function on each line in Column (a), and enter the catalog number in Column (b). For applications pertaining to multiple programs where none of the programs require a breakdown by function or activity, enter the catalog program title on each line in **Column** (a) and the respective catalog number on each line in Column (b).
For applications pertaining to **multiple** programs where one or more programs **require** a breakdown by function or activity, prepare a separate sheet for each program requiring the breakdown. Additional sheets should be used when one form does not provide adequate space for all breakdown of data required. However, when more than one sheet is used, the first page should provide the summary totals by programs.

Lines 1-4, Columns (c) through (g)

For new applications, leave Columns (c) and (d) blank. For each line entry in Columns (a) and (b), enter in Columns (e), (f), and (g) the appropriate amounts of funds needed to support the project for the first funding period (usually a year).

the amounts shown in Columns (e
equal the sum of amounts in Colu

Line 5—Show the totals for all co

Section B. Budget Categories
In the column headings (a) throug
functions, and activities shown on
additional sheets are prepared for
sheet. For each program, functior
Federal and non-Federal) by obje

Lines 6a-i—Show the totals of Lir

Line 6j—Show the amount of indi

Line 6k—Enter the total of amour
grants and continuation grants the
same as the total amount shown i
grants and changes to grants, the
Columns (1)-(4), Line 6k should b
Columns (e) and (f) on Line 5.
Line 7—Enter the estimated amo
this project. Do not add or subtrac
under the program narrative state
amount of program income may b
determining the total amount of th

Section C. Non-Federal Resources

Lines 8-11—Enter amounts of non-Federal resources that will be used on the grant. If in-kind contributions are included, provide a brief explanation on a separate sheet.

Column (a)—Enter the program titles identical to Column (a), Section A. A breakdown by function or activity is not necessary.

Column (b)—Enter the contribution to be made by the applicant.

Column (c)—Enter the amount of the State's cash and in-kind contribution if the applicant is not a State or State agency. Applicants which are a State or State agencies should leave this column blank.

Column (d)—Enter the amount of cash and in-kind contributions to be made from all other sources.

Column (e)—Enter totals of Columns (b), (c), and (d).

Line 12—Enter the total for each of Columns (b)-(e). The amount in Column (e) should be equal to the amount on Line 5, Column (f) Section A.

Section D. Forecasted Cash Needs

Line 13—Enter the amount of cash needed by quarter from the grantor agency during the first year.

Section E. Budget Estimates
Project

Lines 16-19—Enter in Columr
Column
(a), Section A. A breakdown b
applications and continuation
amounts of Federal funds whic
project over the succeeding fu
need not be completed for revi
funds for the current year of e
If more than four lines are nee
schedules as necessary.

Line 20—Enter the total for ea
schedules are prepared for thi
overall totals on this line.

Section F. Other Budget Infc

Line 21—Use this space to ex
cost categories that may appe
details as required by the Fede

Line 22—Enter the type of ind
fixed) that will be in effect durir
the base to which the rate is a

Line 14—Enter the amount of cash from all other sources needed by quarter during the first year.

Line 15—Enter the totals of amounts on Lines 13 and 14.

Line 23—Provide any other e›

OMB Approval No. 0348-0044

New or Revised Budget

Non-Federal (f)	Total (g)
	$6,999,575
	$0
	$0
	$0
$0	$6,999,575

(4)	Total (5)
	$262,919
	$160,380
	$14,400
	$0
	$0
	$4,645,069
	$0
	$1,735,000
$0	$6,817,768
	$181,807
$0	$6,999,575
	$0

SF-424A (Rev. 4-92)
Prescribed by OMB Circular A-102

(d) Other Sources	(e) **Totals**
	$0
	$0

	$0
	$0
$0	$0

3rd Quarter	4th quarter
$1,749,894	$1,749,894
$1,749,894	$1,749,894

ıding Periods (Years)

(d) Third	(e) Fourth
$0	$0

SF-424A (Rev. 4-92)
Prescribed by OMB Circular A-102

ructions, searching existing data sources, gathering and
ice of Management and Budget; send it to the address

ıpplications, submit these forms before the end of
ıy the grantor agency. Enter in Columns (c) and (d) the
ı will remain unobligated at the end of the grant funding
agency instructions provide for this. Otherwise, leave
umns (e) and (f) the amounts of funds needed for the
in Column (g) should be the sum of amounts in

ıanges to existing grants, do not use Columns (c)
ımount of the increase or decrease of Federal funds
nt of the increase or decrease of non-Federal funds. In
ıdgeted amount (Federal and non-Federal) which
ized budgeted amounts plus or minus, as appropriate,
ə) and (f). The amount(s) in Column (g) should not

ɔ) and (f). The amount(s) in Column (g) should not
ımns (e) and (f).

lumns used.

ɟh (4), enter the titles of the same programs,
ı Lines 1-4, Column (a), Section A. When
ʳ Section A, provide similar column headings on each
ı or activity, fill in the total requirements for funds (both
ːct class categories.

ɲes 6a to 6h in each column.

irect cost.

ɲts on Lines 6i and 6j. For all applications for new
ɜ total amount in column (5), Line 6k, should be the
in Section A, Column (g), Line 5. For supplemental
ɜ total amount of the increase or decrease as shown in
ɜe the same as the sum of the amounts in Section A,

unt of income, if any, expected to be generated from
ːt this amount from the total project amount. Show
ːment the nature and source of income. The estimated
ɔe considered by the federal grantor agency in
ıe grant.

ɜ of Federal Funds Needed for Balance of the

ɲ (a) the same grant program titles shown in

y function or activity is not necessary. For new
grant applications, enter in the proper columns
ɔh will be needed to complete the program or
nding periods (usually in years). This section
isions (amendments, changes, or supplements) to
ӽisting grants.
ded to list the program titles, submit additional

ɜch of the Columns (b)-(e). When additional
s Section, annotate accordingly and show the

ɔrmation

ːplain amounts for individual direct object-class
ar to be out of the ordinary or to explain the
ɜral grantor agency.

lirect rate (provisional, predetermined, final or
ɲg the funding period, the estimated amount of
pplied, and the total indirect expense.

PMC123.1 - Budget Justification for SF 424A Budget

Instructions and Summary

Award Number: DE-FOA-0000148
Award Recipient: Association of Bay Area

Date of Submission: 14-Dec-09
Form submitted by: County of Los Angeles
(May be award recipient or sub-recipient)

Please read the instructions on each page before starting.
If you have any questions, please ask your DOE contact. It will save you time!

On this form, provide detailed support for the estimated project costs identified on the SF-424A form (Budget).

- The dollar amounts on this page must match the amounts on the associated SF-424A.
- The award recipient and each sub-recipient with estimated costs of $100,000 or more must complete this form and a SF-424A form.
- The total budget presented on this form and on the SF424A must include both Federal (DOE), and Non-Federal (cost share) portions, thereby reflecting TOTAL PROJECT COSTS proposed.
- For costs in each Object Class Category on the SF-424A, complete the corresponding worksheet on this form (tab at the bottom of the page).
- All costs incurred by the preparer's sub-recipients, vendors, contractors, consultants and Federal Research and Development Centers (FFRDCs), should be entered only in section f. Contractual. All other sections are for the costs of the preparer only.

SUMMARY OF BUDGET CATEGORY COSTS PROPOSED

(Note: The values in this summary table are from entries made in each budget category sheet.)

CATEGORY	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Total Costs	Project Costs %	Comments (Add comments as needed)
a. Personnel	$240,414	$250,437	$262,919	**$753,770**	**3.5%**	
b. Fringe Benefits	$141,844	$152,767	$160,380	**$454,991**	**2.1%**	
c. Travel	$14,400	$14,400	$14,400	**$43,200**	**0.2%**	
d. Equipment	$0	$0	$0	**$0**	**0.0%**	
e. Supplies	$0	$0	$0	**$0**	**0.0%**	
f. Contractual						
Sub-recipient	*$0*	*$0*	*$0*	*$0*	*0.0%*	
FFRDC	*$0*	*$0*	*$0*	*$0*	*0.0%*	
Vendor	*$3,389,501*	*$6,524,991*	*$4,645,069*	*$14,559,561*	*66.9%*	
Total Contractual	$3,389,501	$6,524,991	$4,645,069	**$14,559,561**	**66.9%**	
g. Construction	$0	$0	$0	**$0**	**0.0%**	
h. Other Direct Costs	$1,677,000	$2,028,000	$1,735,000	**$5,440,000**	**25.0%**	
i. Indirect Charges	$164,180	$173,176	$181,807	**$519,163**	**2.4%**	
Total Project Costs	$5,627,339	$9,143,771	$6,999,575	$21,770,685	100.0%	

Additional Explanations/Comments (as necessary)

a. Personnel

PLEASE READ!!!

List costs solely for employees of the entity completing this form (award recipient or sub-recipient). All other personnel costs (of subrecipients or other contractual efforts of the entity preparing this) must be included under f., Contractual. This includes all consultants and FFRDCs.

Identify positions to be supported. Key personnel should be identified by title. All other personnel should be identified either by title or a group category. State the amounts of time (e.g., hours or % of time) to be expended, the composite base pay rate, total direct personnel compensation and identify the rate basis (e.g., actual salary, labor distribution report, technical estimate, state civil service rates, etc.).

Add rows as needed. Formulas/calculations will need to be entered by the preparer of this form. Please enter formulas as shown in the example.

Task # and Title	Position Title	Budget Period 1			Budget Period 2			Budget Period 3			Project Total Hours	Project Total Dollars	Rate Basis
		Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 1	Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 2	Time (Hours)	Pay Rate ($/Hr)	Total Budget Period 3			
1. Generation 2A Receiver Design		**10000**		**$423,000**	**600**		**$24,000**	**800**		**$31,000**	**11400**	**$478,000**	**Actual Salary**
EXAMPLE	Sr. Engineer	2000	$85.00	$170,000	200	$50.00	$10,000	200	$50.00	$10,000	**2400**	**$190,000**	Actual Salary
ONLY!!!	Electrical engineers	6200	$35.00	$217,000	400	$35.00	$14,000	600	$35.00	$21,000	**7200**	**$252,000**	Actual Salary
	Technician	1800	$20.00	$36,000	0	$0.00	$0	0	$0.00	$0	**1800**	**$36,000**	Actual Salary
Association of Bay Area Governments													
	Sr Admin Officer	800	$59.41	$47,528	800	$61.19	$48,952	800	$63.03	$50,424	**2400**	**$146,904**	Actual Salary
	Planner	100	$41.82	$4,182	100	$45.22	$4,522	100	$48.91	$4,891	**300**	**$13,595**	Actual Salary
	Accounting Specialist	800	$40.26	$32,208	800	$41.47	$33,176	800	$43.30	$34,640	**2400**	**$100,024**	Actual Salary
	Asst. Finance Director	400	$60.28	$24,112	400	$65.19	$26,076	400	$70.50	$28,200	**1200**	**$78,388**	Actual Salary
	Legal Assistant 60%	100	$29.94	$2,994	100	$32.38	$3,238	100	$35.02	$3,502	**300**	**$9,734**	Actual Salary
	Project Manager	1100	$65.82	$72,402	1100	$68.72	$75,592	1100	$70.79	$77,869	**3300**	**$225,863**	Actual Salary
	Admin. Secretary	200	$35.08	$7,016	200	$36.13	$7,226	200	$39.61	$7,922	**600**	**$22,164**	Actual Salary
	Legal Counsel	100	$104.82	$10,482	80	$112.19	$8,975	80	$120.04	$9,603	**260**	**$29,060**	Actual Salary
	Accounting Specialist	450	$37.29	$16,781	450	$40.32	$18,144	450	$43.61	$19,625	**1350**	**$54,549**	Actual Salary
	Finance Director	100	$82.89	$8,289	100	$89.90	$8,990	100	$95.62	$9,562	**300**	**$26,841**	Actual Salary
	Deputy Executive Director	100	$105.66	$10,566	100	$113.77	$11,377	100	$121.73	$12,173	**300**	**$34,116**	Actual Salary
	Accounting Technician	140	$27.53	$3,854	140	$29.78	$4,169	140	$32.20	$4,508	**420**	**$12,531**	Actual Salary
	Total Personnel Costs	**4390**		**$240,414**	**4370**		**$250,437**	**4370**		**$262,919**	**0**	**$753,770**	

Additional Explanations/Comments (as necessary)

b. Fringe Benefits

	Budget Period 1	Budget Period 2	Budget Period 3	Total
Rate applied:	59.0%	61.0%	61.0%	
Total fringe requested:	$141,844	$152,767	$160,380	**$454,991**

A federally approved fringe benefit rate agreement, or a proposed rate supported and agreed upon by DOE for estimating purposes is required if reimbursement for fringe benefits is requested. Please check (X) one of the options below and provide the requested information, if it has not already been provided to the Contracting Officer, OR if it has changed since it was. Calculate the fringe rate and enter the total amount in Section B, line 6.b. ("Fringe Benefits") of form SF-424A.

____ **A fringe benefit rate has been negotiated with, or approved by, a federal government agency. A copy of the latest rate agreement is included with this application, and will be provided electronically to the Contracting Officer for this project.**
(When this option is selected, a presentation of the budget that demonstrates the appliction of the approved rate, to arrive at the proposed fringes benefits dollars should also be provided.)

√ **There is not a current, federally approved rate agreement negotiated and available.**
(When this option is checked, the entity preparing this form shall submit a rate proposal in the format provided at the following website, or a format that provides the same level of information and which will support the rates being proposed for use in performance of the proposed project. Go to https://www.eere-pmc.energy.gov/forms.aspx and select PMC 400.2 Sample Rate Proposal.)

Additional explanation/comments (as necessary)

c. Travel

PLEASE READ!!!

Provide travel detail as requested below, identifying total Foreign and Domestic Travel as separate items. Purpose of travel are items such as professional conference, DOE sponsored meeting, project management meeting, etc. The Basis for Estimating Costs are items such as past trips, current quotations, Federal Travel Regulations, etc.

All listed travel must be necessary for performance of the Statement of Projecct Objectives.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

Purpose of travel	No. of Travelers	Depart From (not required for domestic travel)	Destination (not required for domestic travel)	No. of Days	Cost per Traveler	Cost per Trip	Basis for Estimating Costs
Budget Period 1							
Domestic Travel							
EXAMPLE ONLY!!! Visit to PV cell mfr. to set up vendor agreement	2			2	$650	$1,300	Internet prices
Quarterly team meeting in LA	4	Oakland	Los Angeles	2	$900	$3,600	$500 plane fare, $150 hotel (2 nights), $50 per diem (2 days)
Quarterly team meeting in LA	4	Oakland	Los Angeles	2	$900	$3,600	
Quarterly team meeting in LA	4	Oakland	Los Angeles	2	$900	$3,600	
Quarterly team meeting in LA	4	Oakland	Los Angeles	2	$900	$3,600	
						$0	
						$0	
						$0	
Domestic Travel subtotal						$14,400	
International Travel							
						$0	
						$0	
						$0	
						$0	
International Travel subtotal						$0	
Budget Period 1 Total						**$14,400**	
Budget Period 2							
Domestic Travel							
Quarterly team meeting in LA	4	Oakland	Los Angeles	2	$900	$3,600	
Quarterly team meeting in LA	4	Oakland	Los Angeles	2	$900	$3,600	
Quarterly team meeting in LA	4	Oakland	Los Angeles	2	$900	$3,600	
Quarterly team meeting in LA	4	Oakland	Los Angeles	2	$900	$3,600	

Purpose of travel	No. of Travelers	Depart From (not required for domestic travel)	Destination (not required for domestic travel)	No. of Days	Cost per Traveler	Cost per Trip	Basis for Estimating Costs
Domestic Travel subtotal						$14,400	
International Travel							
International Travel subtotal						$0	
Budget Period 2 Total						**$14,400**	
Budget Period 3							
Domestic Travel							
Quarterly team meeting in LA	4	Oakland	Los Angeles	2	$900	$3,600	
Quarterly team meeting in LA	4	Oakland	Los Angeles	2	$900	$3,600	
Quarterly team meeting in LA	4	Oakland	Los Angeles	2	$900	$3,600	
Quarterly team meeting in LA	4	Oakland	Los Angeles	2	$900	$3,600	
						$0	
						$0	
						$0	
Domestic Travel subtotal						$14,400	
International Travel							
						$0	
						$0	
						$0	
						$0	
International Travel subtotal						$0	
Budget Period 3 Total						**$14,400**	
PROJECT TOTAL						**$43,200**	

Additional Explanations/Comments (as necessary)

d. Equipment

PLEASE READ!!!

Equipment is generally defined as an item with an acquisition cost greater than $5,000 and a useful life expectancy of more than one year. Further definitions can be found at 10 CFR 600 found on the PMC Recipient Resources Forms page at https://www.eere-pmc.energy.gov/Forms.aspx#regs .

List all proposed equipment below, providing a basis of cost such as vendor quotes, catalog prices, prior invoices, etc., and briefly justifying its need as it applies to the Statement of Project Objectives. If it is existing equipment, and the value of its contribution to the project budget is being shown as cost share, provide logical support for the estimated value shown. If it is new equipment which will retain a useful life upon completion of the project, provide logical support for the estimated value shown.

For equipment over $50,000 in price, also include a copy of the associated vendor quote or catalog price list.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

Equipment Item	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
Budget Period 1					
EXAMPLE ONLY!!! Thermal shock chamber	2	$20,000	$40,000	Vendor Quote	Reliability testing of PV modules- Task 4.3
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
Budget Period 1 Total			$0		
Budget Period 2					
			$0		
			$0		
			$0		
			$0		
Budget Period 2 Total			$0		

Equipment Item	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
Budget Period 3 Total			$0		
PROJECT TOTAL			$0		

Additional Explanations/Comments (as necessary)

e. Supplies

PLEASE READ!!!

Supplies are generally defined as an item with an acquisition cost of $5,000 or less and a useful life expectancy of less than one year. Supplies are generally consumed during the project performance. Further definitions can be found at 10 CFR 600 found on the PMC Recipient Resources Forms page at https://www.eere-pmc.energy.gov/Forms.aspx#regs.

List all proposed supplies below, providing a bases of cost such as vendor quotes, catalog prices, prior invoices, etc., and briefly justifying the need for the Supplies as they apply to the Statement of Project Objectives. Note that Supply items must be direct costs to the project at this budget category, and not duplicative of supply costs included in the indirect pool that is the basis of the indirect rate applied for this project.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

General Category of Supplies	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
Budget Period 1					
EXAMPLE ONLY!!! Wireless DAS components	10	$360.00	$3,600	Catalog price	For Alpha prototype - Task 2.4
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
Budget Period 1 Total			**$0**		
Budget Period 2					
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
Budget Period 2 Total			$0		

General Category of Supplies	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
Budget Period 3					
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
			$0		
Budget Period 3 Total			$0		
PROJECT TOTAL			**$0**		

Additional Explanations/Comments (as necessary)

f. Contractual

PLEASE READ!!!

The entity completing this form must provide all costs related to sub-recipients, vendors, contractors, consultants and FFRDC partners in the applicable boxes below.

Sub-recipients (partners, sub-awardees):

For each sub-recipient with total project costs of $100,000 or more, a separate SF-424A budget and PMC123.1 budget justification form must be submitted. These sub-recipient forms may be completed by either the sub-recipients themselves or by the preparer of this form. The budget totals on the sub-recipient's forms must match the sub-recipeint entries below.

The preparer of this form need only provide further support of the completed sub-recipient budget forms as they deem necessary. The support to justify the budgets of sub-recipients with estimated costs less than $100,000 may be in any format, and at a minimum should provide what Statement of Project Objectives task(s) are being performed, the purpose/need for the effort, and a basis of the estimated costs that is considered sufficient for DOE evaluation.

Vendors (includes contractors and consultants):

List all vendors, contractors and consultants supplying commercial supplies or services used to support the project. The support to justify vendor costs (in any amount) should provide the purpose for the products or services and a basis of the estimated costs that is considered sufficient for DOE evaluation.

Federal Research and Development Centers (FFRDCs):

For FFRDC partners, award recipient will provide a Field Work Proposal (if not already provided with the original application), along with the FFRDC labor mix and hours, by category and FFRDC major purchases greater than $25,000, including Quantity, Unit Cost, Basis of Cost, and Justification. The award recipient may allow the FFRDC to provide this information directly to DOE.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

Sub-Recipient Name/Organization	Purpose/Tasks in SOPO	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Project Total
EXAMPLE ONLY!!! XYZ Corp.	Partner to develop optimal fresnel lens for Gen 2 product - Task 2.4	$48,000	$32,000	$16,000	$96,000
					$0
					$0
					$0
					$0
					$0

Sub-Recipient Name/Organization	Purpose/Tasks in SOPO	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Project Total
					$0
					$0
					$0
	Sub-total	$0	$0	$0	$0

Vendor Name/Organization	Product or Service, Purpose/Need and Basis of Cost (Provide additional support at bottom of page as needed)	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Project Total
EXAMPLE ONLY!!! ABC Corp.	Vendor for developing custom robotics to perform lens inspection, alignment, and placement (Task 4). Required for expanding CPV module mfg. capacity. Cost is from competitive quotes.	$32,900	$86,500		$119,400
Sonoma County Transportation Authority	On-water-bill financing pilot: program design, including market analysis, and administrative system development	$471,000	$141,000	$53,000	$665,000
Sonoma County Transportation Authority	Neighborhood pilot, Santa Rosa	$469,170	$247,915	$247,915	$965,000
Stopwaste.Org, City/County of San Francisco, County TBD	Multifamily pilot	$1,000,000	$1,000,000	$902,500	$2,902,500
City/County of San Francisco	Neighborhood pilot: 2-4 unit apartments, ACE hardware channels	$365,000	$350,000	$258,592	$973,592
Stopwaste.Org	Single-family pilot, Lowe's distribution channel	$600,000	$1,200,000	$600,000	$2,400,000
City of San Jose, Other Agency TBD	Neighborhood pilot		$3,135,305	$2,000,000	$5,135,305
City/County of San Francisco	Commercial pilot	$358,284	$387,747	$141,896	$887,927
Contractor TBD	EM&V	$126,047	$63,024	$441,166	$630,237
					$0
		$3,389,501	$6,524,991	$4,645,069	$14,559,561

f. Contractual

Sub-Recipient Name/Organization	Purpose/Tasks in SOPO	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Project Total
FFRDC Name/Organization	Purpose	Budget Period 1 Costs	Budget Period 2 Costs	Budget Period 3 Costs	Project Total
					$0
					$0
					$0
		$0	$0	$0	$0

Total Contractual		$3,389,501	$6,524,991	$4,645,069	$14,559,561

AdditionalExplanations/Comments (as necessary)

f. Contractual

g. Construction

PLEASE READ!!!

Construction, for the purpose of budgeting, is defined as all types of work done on a particular building, including erecting, altering, or remodeling. Construction conducted by the award recipient is entered on this page. Any construction work that is performed by a vendor or subrecipient to the award recipient should be entered under f. Contractual.

List all proposed construction below, providing a basis of cost such as engineering estimates, prior construction, etc., and briefly justify its need as it applies to the Statement of Project Objectives.

Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

Overall description of construction actiivities:

Example Only!!! - Build wind turbine platform

General Description	Cost	Basis of Cost	Justification of need
Budget Period 1			
Three days of excavation for platform site EXAMPLE ONLY!!!	$28,000	Engineering estimate	Site must be prepared for construction of platform.
Budget Period 1 Total	$0		
Budget Period 2			
Budget Period 2 Total	$0		
Budget Period 3			

General Description	Cost	Basis of Cost	Justification of need
Budget Period 3 Total	$0		
PROJECT TOTAL	$0		

Additional Explanations/Comments (as necessary)
