Integrated Home Water Savings with Energy Star

Response to DWR Project Water Use Efficiency Proposal Solicitation, Section B

Due Date: January 11, 2005

Submitted to:
Debra Gonzalez
Contract Officer
California Department of Water Resources
Office of Water Use Efficiency
P.O. Box 942836
Sacramento, CA 94236-0001

Submitted by:
CALIFORNIA BUILDING PERFORMANCE CONTRACTORS ASSOCIATION
In association with Bevilacqua-Knight, Inc. and ICF Consulting
550 Kearny Street, Suite 1010
San Francisco, CA 94108
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CALIFORNIA BUILDING PERFORMANCE CONTRACTORS ASSOCIATION
550 Kearny Street, Suite 1010
San Francisco, CA 94108

January 21, 2005

California Department of Water Resources
1415 Ninth Street, Room 338
Sacramento, CA 95814

Attention: Debra Gonzalez

Re: Proposal in Response to 2004 Water Use Efficiency PSP:

Dear Ms. Gonzalez,

The California Building Performance Contractors Association is pleased to submit this proposal for a unique and highly leveraged pilot water efficiency project for the DWR's consideration.

CBPCA has assembled a team that includes Bevilacqua-Knight, Inc. (BKi) and ICF Associates, Inc., a wholly owned subsidiary of ICF Consulting Group, Incorporated, with strong collaborative support from the Energy Star Residential Office of the U.S. Environmental Protection Agency and our own ongoing "Home Performance with Energy Star" project for the CPUC. This proposed project offers a new way to gain maximum water savings in existing homes through use of an innovative contractor-based process already in place.

If you have any questions about our proposal, please do not hesitate to contact us. Dr. Robert Knight, our proposed project manager, may be reached at 510.444.8707 x223 or rknight@bki.com.

Don Solem
Chairman, CBPCA Board of Directors

2004 Water Use Efficiency Proposal Solicitation Package

APPENDIX A: Project Information Form

Applying for:

☑ Urban ❑ Agricultural

1. (Section A) Urban or Agricultural Water Use Efficiency Implementation Project

❑ (a) implementation of Urban Best Management Practice, #_____

❑ (b) implementation of Agricultural Efficient Water Management Practice, #_____

❑ (c) implementation of other projects to meet California Bay-Delta Program objectives, Targeted Benefit # or Quantifiable Objective #, if applicable _____

❑ (d) Specify other: _____

2. **(Section B) Urban or Agricultural Research and Development; Feasibility Studies, Pilot, or Demonstration Projects; Training, Education or Public Information; Technical Assistance**

☑ (e) research and development, feasibility studies, pilot, or demonstration projects

❑ (f) training, education or public information programs with statewide application

❑ (g) technical assistance

❑ (h) other

3. Principal applicant (Organization or affiliation): California Building Performance Contractors Ass'n.

4. Project Title: Integrated Home Water Savings with Energy Star

5. Person authorized to sign and submit proposal and contract:

Name, title	Robert L. Knight, Board Member/Project Mgr.
Mailing address	C/o BKi, Suite 410 1000 Broadway Oakland, CA 94607
Telephone	510.444.8707 x223
Fax.	510.463.2690
E-mail	rknight@bki.com

6. Contact person (if different):

Name, title. same

Mailing address.

Telephone

Fax.

E-mail

7. Grant funds requested (dollar amount): **$568,902**

(from Table C-1, column VI)

8. Applicant funds pledged (dollar amount): $20,000 (cash from EPA)
$50,000 (in-kind from CBPCA)

9. Total project costs (dollar amount): $588,902
(from Table C-1, column IV, row n)

10. Percent of State share requested (%) 96.6%
(from Table C-1)

11. Percent of local share as match (%) **from EPA** 3.4
(from Table C-1)

12. Is your project locally cost effective?
Locally cost effective means that the benefits to an entity (in dollar terms) of implementing a program exceed the costs of that program within the boundaries of that entity.
(If yes, provide information that the project in addition to Bay-Delta benefit meets one of the following conditions: broad transferable benefits, overcome implementation barriers, or accelerate implementation.)

❑ (a) yes
☑ (b) no

11. Is your project required by regulation, law or contract?
If no, your project is eligible.
If yes, your project may be eligible only if there will be accelerated implementation to fulfill a future requirement and is not currently required.
Provide a description of the regulation, law or contract and an explanation of why the project is not currently required.

❑ (a) yes
☑ (b) no

This is a pilot project to confirm the value of the proposed concept for Statewide use.

12. Duration of project (month/year to month/year):	12/05 to 12/08 (3 yrs)
13. State Assembly District where the project is to be conducted:	Multiple—all Northern California (PG&E)
14. State Senate District where the project is to be conducted:	Multiple—all Northern California (PG&E)
15. Congressional district(s) where the project is to be conducted:	Multiple—all Northern California (PG&E)
16. County where the project is to be conducted:	Multiple—all Northern California (PG&E)
17. Location of project (longitude and latitude)	All Northerrn California
18. How many service connections in your service area (urban)?	Multiple districts; millions of connections
19. How many acre-feet of water per year does your agency serve?	N/a; applicant is not a water agency

20. Type of applicant (select one):

- ❑ (a) City
- ❑ (b) County
- ❑ (c) City and County
- ❑ (d) Joint Powers Authority
- ❑ (e) Public Water District
- ❑ (f) Tribe
- ☑ (g) Non Profit Organization
- ❑ (h) University, College
- ❑ (i) State Agency
- ❑ (j) Federal Agency
- ❑ (k) Other
  - ❑ (i) Investor-Owned Utility
  - ❑ (ii) Incorporated Mutual Water Co.
  - ❑ (iii) Specify _____

21. Is applicant a disadvantaged community? If 'yes' include annual median household income. (Provide supporting documentation.)

- ❑ (a) yes, _____ median household income
- ☑ (b) no

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APPENDIX B: Signature Page

By signing below, the official declares the following:

The truthfulness of all representations in the proposal;

The individual signing the form has the legal authority to submit the proposal on behalf of the applicant;

There is no pending litigation that may impact the financial condition of the applicant or its ability to complete the proposed project;

The individual signing the form read and understood the conflict of interest and confidentiality section and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant;

The applicant will comply with all terms and conditions identified in this PSP if selected for funding; and

The applicant has legal authority to enter into a contract with the State.

Signature	Name and Title	Date
Don Solem	**Don Solem, CBPCA Chair**	**1/10/05**

1. INTRODUCTION AND OVERVIEW

What is this Project? This proposed pilot project, offered with the support of the U.S. Environmental Protection Agency, is designed to test an innovative approach for delivering water conservation in conjunction with energy efficiency to residential customers. This pilot project leverages CBPCA's existing "Home Performance with ENERGY STAR" program that is focused on energy savings and improvements in home safety, comfort, health, and value. The existing Home Performance program, funded by the CPUC, covers much of the PG&E service territory. Its CBPCA-trained contractors inspect, test, and diagnose home deficiencies and provide a one-stop remediation service. The program is continuing to train more contractors, and will add training and field support for water efficiency improvements to be included in the contractors' comprehensive home retrofit projects.

What unique value does this offer? The existing Home Performance with Energy Star program achieves the largest per-home *energy* savings possible, since it integrates the diagnosis, sale, and completion of all feasible improvements. The same will be true for the **water** savings; both indoor and outdoor water uses will be assessed and all improvements made with minimal homeowner effort and risk under a one-stop integrated project approach with confidence in our trained contractors, job financing, and quality assurance.

Leveraging of CPUC investment: Significant effort has gone into developing a contractor outreach and education mechanism, creating a training curriculum, providing resources to support an intensive post-training mentoring program, and keeping track of results. *This infrastructure is fully in place and in use now, all supported by State energy efficiency funding*. This proposed pilot water use efficiency project expands the use of this existing home performance contracting infrastructure by adding water savings measures to be identified and installed as a part of the Home Performance with ENERGY STAR retrofit process. Through this approach we can use the contractors that have already been trained to provide Home Performance services, expand their training, and build on the existing mechanisms for providing contractor support. This is an opportunity to promote water efficiency improvements at a low marginal cost and to increase the value of the existing home performance service to the homeowner.

Future project independence: Will this project, or later water efficiency implementation projects based on it, be able to function effectively if the CBPCA energy efficiency/home performance contracting project ends? Absolutely. The importance of the existing CBPCA project and its CPUC funding is that it is *now* building a network of qualified contractors and educating the industry and the public on this concept. We expect over 100 such contractors to have been trained in the CPUC project before this DWR project begins, with more to come as the integrated whole-house performance contracting concept moves into widespread use through the efforts of the EPA and the energy utilities. With

those contractors in place and the water efficiency training program created in this DWR project, water agencies around the state can field programs cost-effectively based on those contractors and this project's further materials.

Matching Funding: The EPA's ENERGY STAR program is seeking an opportunity for a pilot test of this concept for possible broader use nationwide. This DWR solicitation provides just such an opportunity. In response, the ENERGY STAR Residential Branch is providing a **grant of $20,000 in cash match funding** to contribute to the support of this pilot project, if it is selected by DWR. In addition, the use of the existing CBPCA contractor infrastructure and personnel constitutes an in-kind match funding of even greater value that we attribute to the CPUC energy efficiency program.

In brief, the pilot project will accomplish the following.

- Develop a training module for Home Performance contractors that provides specific information for promoting water efficiency measures to homeowners within the Home Performance with ENERGY STAR program framework.
- Develop materials for Home Performance contractors to use during their home evaluations and meetings with homeowners.
- Deliver the training and materials to Home Performance contractors who have demonstrated ability to provide Home Performance services to homeowners.
- Support the Home Performance contractors in their efforts to incorporate water efficiency measures in their Home Performance services.
- Monitor and evaluate the pilot project to assess how it performed and to develop recommendations for improvements and Statewide implementation.

Through this pilot project, the CBPCA Team expects to further the development of a model for integrating water efficiency into the Home Performance with ENERGY STAR program so that the model can be replicated throughout California as well as in other states with Home Performance programs. Integrating water issues into the existing ENERGY STAR program framework increases the resources and attention provided to water efficiency opportunities. Additionally, it offers an additional delivery channel for promoting water efficiency to residential customers on an ongoing basis. Once this delivery model is refined, individual water agencies would have the opportunity to adopt the approach in their areas at a very low cost.

2. STATEMENT OF WORK, SECTION ONE: *RELEVANCE AND IMPORTANCE (10%)*

The **goal** of this pilot project is to test an innovative approach for delivering water conservation in conjunction with energy efficiency to residential customers. Its more detailed **objectives** include (a) training a set of existing prequalified "home performance contractors, " (b) achieving their integration of substantial water efficiency measures into their home performance projects, (c) evaluating the effectiveness of the project, and (d) refining the process and delivering a plan for broader use by water agencies and cities Statewide.

The project is directly **relevant** to CALFED and improvements in water resource management in the Bay-Delta region. By demonstrating a new delivery channel for water efficiency, the project will enhance the efficient use of California's limited water supplies. The sustainable infrastructure will benefit the Bay-Delta by ensuring that water is used more efficiently in homes. As such, the project assists in meeting CALFED goals:

- Achieve "real water" conservation to reduce water demand.
- Use conservation to maximize use of available water supplies.

The CALFED Bay-Delta program aims to reduce the mismatch between water supplies and expected demand for beneficial water use. Water use efficiency projects constitute one of the key strategies being used to achieve this objective. This pilot program has the potential to provide a new program delivery method that can be added to the set of practices available to water agencies to promote water efficiency. By reaching a new set of market actors (CBPCA-trained home performance contractors), the project will expand the community of professionals promoting water efficiency.

This project addresses the practices identified in the California Department of Water Resources California Water Plan Update 2004 chapter entitled *Urban Water Use Efficiency*. In particular, the pilot project addresses several best management practices (BMPs) and the recommendations to achieve additional urban water use efficiency, including:

- **BMP 1: Residential Survey Programs:** The proposed project trains home improvement contractors to check for leaks, check flow rates, check irrigation systems, and provide homeowners with home analysis results, water saving recommendations, and information.
- **BMP 2: Residential Plumbing Retrofit:** The project includes actual installation of high-quality, low-flow showerheads, toilet flappers (as needed), ULF toilets, recirculating hot water systems, and faucet aerators as practical to residences requiring them.
- **BMP 6: High Efficiency Clothes Washers:** The project contributes to increasing the market share of high efficiency washers (HEWs).

The project is consistent with several actions recommended in the CA Water Plan Update 2004:

- **Work with builders, manufacturers and others to establish a 'Water Star Homes' program for new and existing homes and performance standards for fixtures and appliances, reducing residential water use.** This project initiates a partnership with contractors who currently participate in the Home Performance with ENERGY STAR program, a natural and obvious community to involve in a "Water Star Homes" program.
- **Retrofit remaining standard toilets with more efficient models, such as dual-flush toilets or 1.0 gallon-per-flush toilets.** This project promotes the use of water efficient models at existing homes.
- **Gain more information through surveys and other methods to better understand how Californians use water and how to persuade them to adopt more efficient practices and behaviors.** The evaluation of the training plus feedback from contractors trained will provide information on changes in homeowner behavior based on the contractors' sales.

Reducing consumptive use of water by residential customers helps provide numerous benefits, including improving the Bay-Delta ecosystem and increasing supply reliability. Additionally, energy savings will be realized through reduced pumping requirements.

3. STATEMENT OF WORK, SECTION TWO: Technical/Scientific Merit and Feasibility (25%)

Project Strategy and Methods

This project will deliver whole-house water efficiency improvement using the contractor base and support systems of our large CPUC-funded energy efficiency project. That $3.5 million project is developing and expanding a sustainable capability and market for whole-house contracting services in California, starting in PG&E's service territory. This proposed water efficiency project is a natural beneficiary of that infrastructure.

The proposed project involves creating a new training module on home water use efficiency analysis and improvement, introducing our trained contractors to that new business opportunity, conducting a series of training sessions around the PG&E territory, and providing field mentoring and quality assurance. Project reporting to DWR will use the data management system already in place for contractor inputs on job scopes, costs, test results and customer satisfaction.

Project Procedures

An overview of the project tasks and activities is as follows:

- **Curriculum and materials** will be based on the latest research and field experiences involving residential water efficiency measures. A Project Review Committee including leading California experts, associations, and agencies will be used to review and confirm the quality of this new curriculum.
- **Training, mentoring, and job quality assurance** will employ the current CBPCA home performance program field staff and training standards, with added expertise in water use efficiency measures. At least 10% of the jobs reported by each contractor will be formally inspected and tested as needed for assurance.
- **Monitoring and evaluation** must be objective and will be conducted to professional standards by a qualified subcontractor (ICF Consulting) independent of the training and mentoring process.
- **Data management and reporting** will make use of our existing data system, with the required DWR quarterly reports to include contractors trained, homes tested and repaired, measures taken for each project, and estimated water savings based on best published standards adjusted for site conditions.

These activities will be performed in six tasks. Each is described in turn.

Task 1: Project Planning, Startup, Administration, and Reporting

Task 1 will begin the project. The project design and implementation plan will be finalized, including comments from DWR. We will also create a Project Review Committee, to be consulted throughout the project. The committee will include leading water efficiency experts and practitioners, who will review the materials we produce as well as the overall implementation of the project.

By including a Project Review Committee, the project not only receives substantive review but also provides a link between the water efficiency community and the energy efficiency community. This link will help ensure that the existing energy efficiency infrastructure is leveraged in the most effective manner to achieve the water efficiency goals of the project.

Project administration will also be conducted under this task. This administrative activity includes preparing and delivering the necessary reporting to DWR.

Task 2: Develop Training Materials and Marketing Kit for Contractors

The purpose of Task 2 is to develop the training materials and marketing kit that will be used in the program. The training materials and marketing kit will provide CBPCA-trained contractors with the information and tools needed to:

- identify a full range of water conservation opportunities in homes;
- evaluate and convince the homeowner of the costs and benefits of the available water conservation opportunities that the contractor can provide
- provide information to homeowners on additional measures *they* can take to improve water efficiency (i.e., measures that the contractor is not able to provide, such as purchasing a resource-efficient clothes washer).

The training materials and marketing kit will be developed using information on residential water efficiency measures that has been developed and documented as applicable and appropriate in California. The recently published *BMP Costs and Savings Study*[1] provides a summary of relevant information. Additionally, project team member ICF Consulting has recently summarized available residential measures, specifically in terms of how they can be promoted within the framework of the energy efficiency program infrastructure.[2] Table 1 lists the water efficiency measures that we expect to include in the materials.

A key aspect of developing these training and marketing materials is to present the information in a manner that enables Home Performance contractors to promote the measures to homeowners. Consequently, the materials will focus

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[1] *BMP Costs and Savings Study, A Guide to Data and Methods for Cost-Effective Analysis of Urban Water Conservation Best Management Practices*, by A & N Technical Services, Inc., prepared for The California Urban Water Conservation Council, Sacramento, California, December 2003.

[2] *Water and Energy: Leveraging Energy Efficiency Initiatives to Improve Water Use Efficiency*, prepared by Michael Gibbs and Matthew Morris, ICF Consulting, prepared for the Climate Protection Partnerships Division, Washington, D.C., Review Draft, December 14, 2004.

on the benefits and costs from the homeowner's perspective and will equip contractors with the tools to present the information to homeowners in a clear and convincing manner. Special attention will be paid to preparing the materials to mesh with and complement the existing materials provided to the contractors on energy, indoor air quality, heating, cooling, and other quality-of-life issues.

Table 1: Residential Water Efficiency Measures to be Included

Indoor
Replace standard toilet with ULF Toilet
Replace worn toilet flapper valve with new valve, and adjust properly
Install a hot water recirculation system
Faucet drip repair or replacement
Replace standard showerhead with LF showerhead
Install sink aerators
Replace standard clothes washer with resource efficient version
Replace standard dishwasher with a resource efficient dishwasher
Outdoor
Re-program existing sprinkler timers to match water needs (use existing functionality)
Install and program controllers with improved functionality
Install and program controllers with advanced functionality (ET based)
Install a swimming pool cover
Redesign sprinkler system and re-landscape
Other leaks

The materials will be developed in several steps. First the Project Review Committee will be consulted to identify the latest available information. The available information will be used to create the first draft of the materials. Following review of the first draft by the Project Review Committee, the materials will be revised and tested on one or two contractors. Based on the response from the contractor test, the final materials will be prepared. The deliverables from this task are the training materials and marketing kits for the contractors.

As part of developing these materials, we will explore the possibility of providing promotional products to contractors to help them promote water efficiency. One of the options we will examine is providing the contractors with information on how to best replace flapper valves in leaking toilets. In particular, information on how to match the flapper valve to the specific toilet and how to adjust the valve to provide proper performance would be of particular value.

Task 3: Contractor Solicitation and Training

The purpose of Task 4 is to recruit contractors into the project and to deliver the training to each. The CBPCA energy efficiency project is training contractors now at a rate of about 30-40 per year; by the time this project is scheduled to start we will have trained over 100, and expect to continue through this project's term. We have ready access to those trained contractors, and will solicit their participation individually. We anticipate enhancing 30 of those contractors in the first year with a one-day water efficiency training session plus field support, and adding 30 more in each of years 2 and 3 for a total of 90 during the project term.

Task 4: Field Review, Mentoring, and Quality Assurance

The purpose of Task 4 is to provide ongoing support to the trained contractors who are actively promoting whole-house efficiency improvements. This support includes providing substantive reviews and assistance to contractors who are diagnosing problems in the field and proposing solutions to homeowners.

The present CBPCA energy efficiency project has expert field staff who travel regularly to contractors' offices and work sites to inspect for quality assurance as well as to respond to requests for technical and business advice. These key project staff are home performance and HVAC professionals who are already conversant with water efficiency measures. They will be further trained in this proposed project and will add water efficiency issues to the scope of their regular contractor visits and assistance. The cost to this DWR pilot program will be minimal since the visits are already being made.

Quality assurance is being provided in two ways. First, the project field staff observe and assist as necessary in refining contractors' home inspection and retrofit procedures as jobs are being done. Second, the project staff formally inspect, test as necessary, and report on at least 10% of the reported jobs. Emphasis in such verifications is on the contractors who have proven to need the most help in achieving adequate quality. This QA process will be extended to include water efficiency measures, at minimal marginal cost to this DWR project.

Task 5: Public Outreach Activities

The purpose of Task 5 is to conduct outreach activities to assure accelerated understanding and consideration of the project approach in agencies around the state. Such activities are proposed to be relatively limited due to the pilot stage of the project. Because the existing energy efficiency project is also a pilot, the contractors are trained to market the program to the public directly rather than to rely on broad program marketing that would not be cost-effective due to program scale limitations.

A much more important outreach goal in this water efficiency project is to keep California water districts informed on the project's approach and progress. This will enable those districts to consider and plan for early and effective use of the

approach if appropriate. We will utilize existing contacts in those water districts and other organizations to distribute periodic project bulletins, provide access to further information and reports on the existing project website, and invite questions and visits as desired.

Task 6: Monitoring and Evaluation

The purpose of Task 6 is to conduct independent monitoring and evaluation of the project. The approach for this task is described below under Section Three.

Project Schedule

The following table presents the proposed task schedule, deliverables, and task cost summary (total $589,000). The project term is proposed to be three years. During the first six months, the curriculum and marketing kit will be developed and delivered to the contractors. After a year of working with these materials, the first evaluation will be conducted mid-way through the project, at 18 months. Under this approach, DWR has the option to end the project at that point based on results to date, although we believe a longer test is needed to allow market transformation to develop adequately.

Project Task	***Deliverables***	***Start/End Dates***	***Est. Cost***
1. Project planning, startup, administration, and reporting	Final design & startup	12/1/05—1/31/06	24,000
	Project Review Committee activities	12/1/05—1/31/06	22,000
	Admin and reporting as required by DWR	Per DWR schedule	118,000
2. Training Materials and Marketing Kit	Draft and final versions	12/15/05-3/15/06	158,000
3. Contractor training	Completed trainings	1/15/06-5 cycles/yr	49,000
4. Field review, mentoring, and quality assur.	Access to ongoing results	2/15/06-5 cycles/yr	37,000
5. Outreach activities (incl. To contractors)	Scope expansion for planned events (home shows, media, PRs)	8/1/06 to end	65,000
6. Monitoring and Evaluation	M&E interim and final reports	7/2007 and 12/2008	116,000

Equipment and Facilities

This project requires no equipment or facilities. Everything needed is in place.

Required CEQA Compliance Statement

This is not a "project" as defined by CEQA. This pilot effort will result in no direct or indirect physical change in the environment. The changes produced in each home will significantly reduce water use. It would substantially reduce urban water consumption if expanded to widespread use, but would merely serve to preserve California water resources and Bay/Delta ecosystem health.

4. STATEMENT OF WORK, SECTION THREE: *Monitoring and Assessment (25%)*

The proposed monitoring and evaluation activities are designed to provide information on the effectiveness of the project. Because the project is designed to test an innovative approach for promoting water savings through Home Performance contractors, the monitoring and evaluation focuses on the contractors themselves, and how the project affected their behavior. The activities also try to capture information regarding how to improve the training and other resources offered to contractors to improve their effectiveness in promoting water efficiency. The following activities are planned.

- Training Conducted. We will maintain documentation of each conducted training session, including the contractor personnel in attendance, the date, location, and trainer.
- Baseline Contractor Performance. Each contractor trained will be asked to complete a questionnaire at the training that asks about their pre-training water efficiency activities. Our expectation is that the contractors will indicate little or no prior experience with water efficiency reviews and installations.
- Post Training Evaluation. At the completion of each training, each contractor will be asked to complete a training evaluation that rates the information, materials, and presentation.
- One-Year Contractor Assessment. Approximately one year after the contractor was trained, an assessment will be conducted by administering a questionnaire to the contractor. The questionnaire will assess whether and how the contractor's activities were affected by the training, and whether any water efficiency measures were implemented for homeowners. Recommendations for improving the materials available and the training will be solicited.
- Technical Assistance Assessment. Approximately one year after the contractors have been trained, the experience of the technical assistance providers will be assessed. Observations regarding the activities of the contractors and their ability to promote water efficiency measures within the project framework will be examined.
- Customer References. A limited number of customer references will be requested from the contractors. A limited number of customers will be called to assess their receptivity to water efficiency measures delivered within the project framework.

The results of these activities will be an evaluation report that documents the training performed and assesses the impact of the project on the contractors' performance. Recommendations for improving or modifying the materials,

training, or other activities will be presented. This assessment will be completed approximately mid-way through the project.

A second assessment will be conducted at the end of the project. The same information will be obtained from any newly trained contractors during the second half of the project. The assessments will cover the same topics, and provide a final assessment that reflects the experience throughout the project.

This monitoring and evaluation will be coordinated with the evaluation performed for the energy efficiency program funded by the CPUC. The timing of the evaluation of the energy efficiency aspects of the program may not correspond to the timing of the evaluations performed under this project. Nevertheless, we will ensure that the assessment instruments and approaches are consistent.

5. QUALIFICATIONS OF THE APPLICANT AND COOPERATORS *(5%)*

The CBPCA Project Director will be Dr. Robert (Bob) Knight**,** president of the firm Bevilacqua-Knight, Inc. (BKi). Dr. Knight will prepare task scope and cost proposals, assign staff to tasks, review performance, exert cost control, and assure quality of all deliverables. Dr. Knight is also the firm's lead consultant in market transformation and will be involved technically as appropriate in strategy and activity planning in that area. His resume is in the Appendix, as requested.

The ICF Consulting Task Manager will be Michael Gibbs. Mr. Gibbs is a senior vice president of ICF Consulting and director of ICF Consulting's Los Angeles office. Mr. Gibbs will be responsible for overseeing the development of the training module and marketing kit for the contractors. He will also oversee the monitoring and evaluation activities. Mr. Gibbs has more than 24 years of experience designing and implementing programs to promote resource efficiency and environmental protection. Mr. Gibbs' resume is in the Appendix.

The prime contractor: The California Building Performance Contractors Association was formed in 2001 by a group of environmental advocates to encourage contractors to learn and adopt an integrated whole-house approach to home improvement for health, safety, energy savings, home durability, and value. CBPCA competed for and was awarded two successive contracts by the California Public Utilities Commission to create and operate a whole-house contractor training and marketing support program. This program is now in progress, with oversight by PG&E. Together the two project phases are funded at $3.5 million. CBPCA has an active board but subcontracts most of its activities to qualified firms and individuals with special skills.

Bevilacqua-Knight, Inc. (BKi) will manage the project for CBPCA. BKi has a 25-year track record of providing market research, economic and technical feasibility analyses, planning/management, and communication services to clients in energy and building management. Headquartered in Oakland, California, the company employs about 30 full-time staff at operating centers in Oakland, Sacramento, and El Monte in California, and EPA Research Triangle Park, North Carolina.

A major focus for BKi is characterizing and developing the California market for home performance services that deliver cost-effective energy efficiency and indoor air quality benefits to homeowners. In the CBPCA/CPUC project, BKi oversees the training of remodeling and specialty contractors in conducting comprehensive home diagnoses and identifying appropriate packages of compatible retrofit measures. The project also incorporates efforts to educate general public about the energy efficiency and air quality benefits of implementing home performance improvement upgrades.

BKi also serves as the prime contractor for a related R&D study on home performance contracting for the California Energy Commission's PIER program. This study developed and documented "best practices" for integrated home retrofit commissioning in California, including business models, customer needs, standards, and market development.

BKi Project staffing: Steve Sokolsky of BKi will manage day-to-day project activities and expertise in the development and marketing of water efficiency programs for residential homes, a role which he has played for the CPUC home performance program for three years. Neil Podkorsky and Eric Stern of BKi will provide technical support as needed based on their residential energy efficiency experience and current involvement in the CPUC project. To support the communication of project results, Deborah Griffin will develop graphics and design documents, and Karen Spinner will provide analytical and editing services. Field training, mentoring, and verification will be done by Timothy Locke, a longtime residential construction and energy efficiency expert acting as a CBPCA consultant who will expand his current role as Field Director for the current CPUCproject.

ICF Consulting: ICF Consulting is a leading management, technology, and policy consulting firm. The firm develops solutions to complex energy, environment, emergency management, community development, and transportation issues. Our approach to these issues is strengthened by our expertise in information technology, organizational improvement, program management, and communications. Since 1969, ICF Consulting has been serving major corporations, government at all levels, and multinational institutions. More than 1,000 employees serve these clients from key business centers in the Americas, Europe, and Asia Pacific, including three offices in California: Irvine, San Francisco, and Los Angeles.

One area of focus for ICF Consulting is designing, implementing, and evaluating programs that promote resource efficiency and environmental protection. Among these programs are energy and water efficiency efforts, with special emphasis on residential customers. ICF Consulting supports the U.S. Environmental Protection Agency's ENERGY STAR Homes program, and implements home-related programs regionally in the U.S. Our team includes experts in key fields including engineering, hydrology, finance, marketing, operations, and environmental management.

ICF Consulting Staff will include David Meisegeier and Matthew Morris. Mr. Meisegeier is a Project Manager at ICF Consulting with 11 years of experience in the areas of energy efficiency, indoor environmental quality (IEQ), and pollution prevention. He currently leads a team to provide full-service support to the EPA's voluntary ENERGY STAR market transformation programs (including the ENERGY STAR for Homes program) as well as to other private clients and trade organizations. He will provide perspective on tailoring the water efficiency materials to be consistent with the ENERGY STAR Home program framework and principles. Mr. Meisegeier's resume is attached.

Mr. Morris is an Associate in ICF Consulting's Los Angeles office. Mr. Morris recently contributed to the research and analysis of links between energy and water efficiency opportunities for the U.S. Environmental Protection Agency. Mr. Morris will assist in the development of the training materials and the performance of the contractor evaluations.

External Cooperators

US EPA Energy Star Residential Branch: Energy Star is cooperating through its own monitoring of this pilot project, its permission to use the Energy Star logo for the project, and its provision of $20,000 in match funding in exchange for using this pilot to test our water use efficiency delivery approach for national use.

California Public Utilities Commission: The CPUC, through its funding and monitoring of the original CBPCA Home Performance with Energy Star project, is providing the basic infrastructure that makes this proposed water efficiency project possible. CPUC and electric utility staff will consider such inter-agency collaborations for future use.

Local Northern California Water Districts: We will make use of consumer incentives offered by the water districts in which this project will function, and keep those districts fully briefed on our activities for their own program planning.

Project Review Committee: In association with DWR, we will form a Project Advisory Committee to review curriculum, procedures, and results periodically throughout the project. Included will be representatives of key associations, agencies, and advocates.

Prior Water Efficiency Experience

ICF Consulting is the CBPCA team's primary link to the water efficiency field, although other team members have individual experience as well. ICF brings to the CBPCA Team both breadth and depth in the design and implementation of projects to promote resource efficiency, including both water efficiency and energy efficiency. Examples of recent work on water efficiency projects include the following.

- ***Evaluation of Water Saving Products***. For the U.S. EPA, ICF Consulting identified and evaluated the water saving attributes of a range of residential and commercial products. ICF Consulting evaluated market size (e.g., unit shipments), manufacturer market share, unit water and energy consumption, and potential water and energy savings associated with more efficient equipment. With these analyses, EPA selected products for in-depth market and engineering analyses that are currently underway. The result of these studies will be additional products promoted by EPA through the ENERGY STAR program or other water efficiency programs under development by the agency. Products examined include: autoclaves/ sterilizers, commercial

clothes washers and dishwashers, ice makers, low-flow showerheads, pre-rinse spray valves, soft-serve machines, and spa/pool pumps.

- ***Links Between Water and Energy Efficiency Opportunities***. ICF Consulting is currently evaluating the links between water and energy efficiency issues for the U.S. EPA Climate Protection Partnerships Division. This work involves identifying the direct and indirect linkages between water and energy uses, including residential use, commercial use, water supply systems, wastewater treatment systems, and electricity production. Opportunities to improve both water and energy use together were identified, with emphasis on leveraging existing energy efficiency program infrastructure to expand the promotion of water efficiency in a cost effective manner.
- ***Performance Track***. ICF Consulting developed tools for planning and implementing water use reduction and other environmental performance improvements to support EPA's National Environmental Performance Track, which provides recognition and incentives for environmental performance excellence. We developed cost-benefit analyses of water use reduction objectives; gathered best management practices (BMPs); created action plans to achieve reductions; developed monitoring and measurement approaches; and made resource conservation part of overall operations. We defined measurable goals and schedules for industry-specific tools and management systems elements, led workshops, conducted training sessions, did technical reviews of products and conducted on-site visits to help facilities implement effective, sustainable management systems.
- ***Cleaner Production for Industrial Efficiency (CPIE) Program***. In Thailand, ICF Consulting implemented the CPIE program, a voluntary initiative aimed at reducing industrial water use, wastewater discharge, and energy consumption by a target of 20 percent. The program promoted the adoption of cleaner production practices, and collaborated with local partners on pollution prevention, training, pilot programs, and policy analyses. Participants reduced their water consumption and wastewater generation by approximately 528 million gallons per year.

6. OUTREACH, COMMUNITY INVOLVEMENT, AND ACCEPTANCE *(10%)*

This pilot project has specific needs and targets in its approach to outreach, involvement, and acceptance. That approach is focused on three targets:

- leaders in the water efficiency community (for overall guidance and support)
- home performance contractors (for their agreement and competence to deliver the benefits to homeowners)
- water districts and related State officials (for consideration and future adoption of this and derivative approaches in their districts)

Each target requires different approaches and activities, as described below.

Water Efficiency Leaders

The project is designed to involve key leaders in the California water efficiency community. Through formation and use of a Project Review Committee, the project will involve representatives from water supply agencies and related research groups. This committee will provide several functions:

- **Advice**: The Committee will provide review and advice regarding the materials used in the project. This review will ensure that the latest information regarding water efficiency measures is properly represented in the project.
- **Information Exchange**: The Committee will provide a channel through which the project's activities and results can be communicated throughout the water efficiency community.
- **Coordination**: The project expects to coordinate with any relevant programs being offered in the service territories served by the contractors. The Committee provides a source of information regarding other ongoing efforts to ensure that we coordinate properly.

We will identify and engage these leaders in coordination with the DWR project manager. In our experience most such leaders have been very willing to participate on similar project advisory committees. We anticipate at least two web/phone conferences per year plus contacts with individual panel members as needed.

Home Performance Contractors

The principal activity of this project is the testing of an advanced approach to delivery of actionable knowledge on water efficiency measures to home improvement contractors. This will be done through special seminars and onsite mentoring in home water efficiency measures directed at contractors already involved in the CBPCA Home Performance with ENERGY STAR program. These contractors work throughout their local communities. By training and mentoring these contractors, we are creating sustainable local capabilities to enhance home performance, including improving water efficiency. The program, therefore, is building a delivery infrastructure based on local communities, and that serves local communities. All the benefits derived from the program remain in the local communities.

We will reach these contractors, all of whom we have already trained and continue to monitor, through our existing routine field and back-office communications. These include personal field visits, periodic fax and email project newsletters, periodic technical workshops, and telephone updates. We will also announce the water efficiency project opportunity on our contractor website (www.cbpca.org) and create print materials for mail and hand delivery. To broaden contractor participation, project results will be conveyed to all CBPCA contractors and integrated into the training of new contractors in the program. We expect that most of the home performance contractors will be pleased to add this valuable element to their business.

Water Districts and State Officials

With the success of this project, we anticipate that many water districts will wish to incorporate its lessons and methods into their own programs as quickly as possible. As the project proceeds, we will engage the districts and related State officials in both formal and informal ways. Interim project results will be delivered to California water agencies and presented at regional water agency meetings and conferences during the project term. With DWR approval and cooperation, we will also distribute the project's final report as broadly as possible among the relevant agencies. This effort will be backed by summary web and live presentation materials available to all districts.

7. INNOVATION
(10%)

This pilot project includes a variety of innovations designed to increase homebuyer opportunities and motivations to implement long-lasting water efficiency measures. In the project we propose to test an innovative approach for facilitating water efficiency for residential customers. This delivery channel has the potential to accelerate the adoption of water conserving measures in a cost effective manner. Key innovative aspects of the project include:

- Expansion of the Home Performance with ENERGY STAR concept to include water efficiency in existing homes.
- Creatively adapting an emerging innovative model for delivering energy efficiency to make use of its potential for delivering water efficiency.
- Leveraging the infrastructure of an energy efficiency program to reach a new set of market actors that have not been involved in water efficiency previously: home improvement contractors already Energy Star-trained in integrated whole-house energy/safety/comfort/economy improvements.
- Developing a new training module focusing on helping contractors deliver cost effective water saving measures to homeowners.
- Creating a sustained market presence for water efficiency in the form of trained contractors who continue to promote water efficiency measures as part of their normal business operations.

The innovative nature of the integrated whole-house contracting concept is central to this project's design. In conventional home repair and renovation contracting practice, contractors tend to lack understanding of the integrated functioning of the house as a system, and often make serious errors of diagnosis and repair. They also typically have little appreciation for the interaction of water and energy, both in waste and conservation practices. The ongoing CBPCA project seeks to create a cadre of contractors trained to escape those common errors and become elite "home performance contractors" who can both accurately diagnose and properly repair deficiencies in the home, including the powerful effects of interactions among the home's different components. By tapping this growing pool of expertise in home performance contracting, this proposed pilot project opens a new channel for maximum water efficiency gains in existing homes.

The project will document the performance of this innovative whole-house approach, including identifying opportunities to improve the effectiveness of the materials produced and the approach undertaken. As such, the project will provide information for the continuing development and evolution of improved delivery mechanisms for water efficiency to residential homeowners.

8. COSTS AND BENEFITS
(15%)

Notes on Project Cost Estimation

Table C-1 in the Appendix provides a detailed cost breakdown for this proposed project. This section includes further explanations of those estimated costs.

Labor Cost Notes

The work to be done in each task of the project has been described in earlier sections, along with the assumptions and approaches involved. All labor is at best-customer rates and is documented for audit if required. Rates include all indirect elements such as labor fringes and administrative overhead. The labor hours, staffing, and costs shown in the required Exhibit C-1 are best estimates and may vary in practice. However, the total proposed costs is recognized as a maximum for the work described in this proposal.

CBPCA vs. Consultant Costs: The CBPCA functions as a strategic planning, education, contracting, and administrative body in support of home performance contracting. It has no fulltime staff, and uses both paid and voluntary labor of its Board members as needed. CBPCA is a registered California nonprofit organization, has financial resources, and bears legal responsibility for adequate Board oversight and contractual obligations. CBPCA will provide continuing administrative quality assurance for this project through its Board chairman (Don Solem, president of Solem & Associates) and a Board review committee at no charge.

In accord with this "lean" nonprofit business model, CBPCA subcontracts almost all its activities to carefully selected consultants, both in its overhead and project operations. For this project the principal subcontractors are BKi and ICF Consulting, with BKi acting as Project Manager reporting to the CBPCA Board. All labor billings for this project except for a portion of the administrative costs, as in the case of the CPUC-funded $3.5 million home performance project, will be classified as consultant costs rather than prime contractor labor. However, at DWR's option the CBPCA will hire and staff a portion of the project's administration effort directly. This option can be implemented as a part of the contracting process. However, this has not been necessary with CPUC.

Consultant Rates: The principal consultants have different fringe and overhead burden rates. All rates are audited regularly by State and Federal clients. Although the Form C-1 does not require such detail for consultants, we will provide that detailed level of information if requested.

Equipment, Supplies, and Travel Notes
This project requires no additional equipment. Supplies are also minimal and consist primarily of printing of text materials for the water efficiency training and outreach. Field staff travel for training, field mentoring, and verification is extensive, all within Northern California, but is largely covered by the CBPCA energy efficiency project. Travel for the additional 15 water efficiency training sessions and some administrative review is included in the budget for DWR funding.

"Other" costs are primarily for training venue rental and expenses, printing (mostly copying and assembly of training materials and minimal new outreach media), and communications including team coordination, contractor contacts, and web/phone meetings with the Advisory Committee.

Contingency Funding
No contingency funding is proposed, since the amount would be arbitrary. The proposed budget is intended to cover all anticipated costs. Contingencies should be very limited.

Cost Sharing

The **EPA Energy Star** Residential Office is providing $20,000 in unrestricted cost sharing funds for this project. A letter confirming this Federal government cost sharing is included in the Appendix. This cofunding is shown in the project budget as a reduction in the DWR funding request. It is assigned arbitrarily to one activity (implementation) in Table C-1.

In addition, the **CBPCA** estimates that the in-kind costs of its existing energy efficiency program expenses and staffing services providing a foundation for this proposed project are very high, notably in its continuing search, training, and mentoring of more contractors. Since this work will continue in any case, its cost is not included in the project budget or as cofunding. We note it only to emphasize the leverage gained by this proposed pilot project.

Water Efficiency Benefits

This pilot project will test an innovative approach for delivering water savings in conjunction with energy efficiency for residential customers. At this initial stage the pilot project can produce cost effective water savings for homeowners, although the costs of one-time program activities such as curriculum development, training startup, and formal evaluation will defer public-goods cost effectiveness to later large-scale implementation phases. Once the concept is refined and proven, we expect that it can be implemented in conjunction with energy efficiency programs to produce widespread cost-effective water savings.

We estimate the savings from this pilot project as follows.

- The project will train a target level of 30 contractors in the first year of the training effort. We expect to add an additional 60 by the end of the project.
- Each contractor, on average, is expected to conduct Healthy House Inspections in at least 20 homes per year. The number of home inspections performed per contractor is expected to increase over time as the contractors improve their selling and delivery capabilities. For purposes of this estimate, we assume 20 homes per contractor per year for 2.5 years, for a total of 50 homes per contractor. Given the target of 90 trained contractors, the project should yield some 4500 inspections during that period. We note, however, that this number is artificially limited, since the contractors can be expected to continue to inspect and retrofit more homes far beyond this project's term.
- A significant share of the Healthy House Inspections are expected to result in water efficiency improvements. For purposes of estimating water savings for this proposal, we have assumed low implementation rates on the part of homeowners because this is a new element being undertaken by the contractors for the first time. The sales rate for comprehensive energy efficiency retrofit jobs in the CBPCA project is averaging over 50 percent of the homes inspected. We expect that the realization rate for water efficiency improvements may also soon increase to this level, although Table 2 indicates assumptions no higher than 20% for the measures listed.
- Using the implementation percentages and the expected 4500 homes, the water savings are estimated as the water savings per measure, times the number of homes that implement the measure. Estimates are in Table 2.

Using the assumptions in Table 2, water savings are estimated at 48 acre-feet per year. The savings from the measures implemented would persist over at least five years, and much longer for the most important measures. (At least a 7-year measure life, as indicated to be preferred by DWR, is appropriate for most of the savings.) Over a five-year period of each contractor's efforts, the cumulative estimated savings for all contractors are 240 acre-feet. And once the delivery model is adopted, even without the continuation of this program, most contractors are expected to continue to promote water efficiency as part of their ongoing home performance business.

In **indoor** water measures, the greatest savings are expected from replacing standard toilets with ULF toilets. The savings are well demonstrated from this retrofit. Additionally, the heating, plumbing, and remodeling contractors we are targeting are well qualified to provide this changeout. Replacing leaking flapper valves will also be important in the overall savings. The importance of matching the proper valve to the specific toilet will be emphasized.

For **outdoor** water savings, we expect that improved programming of existing automatic controllers and the replacement of old controllers with controllers with improved functionality will provide the majority of the savings opportunities. Again, the targeted contractors will be able to deliver these services. To promote the more comprehensive outdoor water savings, we expect the contractors to use the services of properly trained landscape professionals. We will help the

trained home performance contractors to make those connections via organizations such as the California Landscape Contractor Association.

Table 2: Estimated Water Savings

Activity	Savings (gal/ home/day)	% Perform	# Homes	Savings (gal/yr)
Indoor Measures				
Replace standard toilet with ULF Toilet	22.0	20%	900	7,227,000
Replace worn toilet flapper valve with new valve, and adjust properly	10.0	13%	600	2,190,000
Faucet drip repair or replacement	2.0	10%	450	328,500
Replace standard showerhead with LF showerhead	3.4	10%	450	558,450
Install sink aerators	1.5	10%	450	246,378
Replace standard clothes washer with a resource efficient clothes washer	16.4	0.4%	18	108,000
Replace standard dishwasher with a resource efficient dishwasher	2.4	0.4%	18	15,480
Install hot water recirculation system	15.0	0.4%	18	98,550
Outdoor Measures				
Re-program existing sprinkler timers to match water needs (use existing functionality)	7.5	13%	600	1,642,500
Install and program controllers with improved functionality	15.0	10%	450	2,464,950
Install and program controllers with advanced functionality (ET based)	45.0	0.1%	5	82,125
Install swimming pool cover	13.7	1%	45	225,000
Redesign sprinkler system - re-landscape	45.0	0.4%	18	295,650
Other leaks (i.e., discovery of in-ground pipe losses or overdrainage)	50.0	5%	225	410,625
Total (gallons/year)				**15,591,468**
Total (Acre-feet/year)				**~48**
Total Over Five Years (Acre-feet)				**~240**

Savings values per household from a review of readily available studies.

% Perform = percent of Healthy House Inspection homes that implements the measure.

Homes estimate based on inspections performed at 4500 homes during the project.

Total Over Five Years reflects the expected persistence of the water savings to be at least five years.

9. APPENDIX: RESUMES AND FORMS

Resumes of Key Project Personnel

Robert Knight	CBPCA Project Manager
Michael Gibbs	Subcontract Manager for ICF
Timothy Locke	Field Director/Lead Trainer
Eric Stern	CBPCA Project Administrator
David Meisegeier	ICF Task Coordinator
Matt Morris	ICF Task Analyst/Evaluator

Dr. Robert (Bob) Knight, President and cofounder of BKi
CBPCA Project Manager for this project

Since the firm's inception 25 years ago, Dr. Knight has been a consultant to many programs of the Electric Power Research Institute, the California Energy Commission, the California Air Resources Board, the California Public Utilities Commission, and various electric utilities, including PG&E and SCE. His professional focus is the planning and management of new-technology market connection programs for resource conservation and sustainability.

Dr. Knight has over 30 years of experience in the energy/environmental field, including extensive research, program planning, and implementation in energy efficiency aspects of buildings and transportation. Currently, he oversees the CPUC's $3.5 million project aimed at expanding the marketplace for home performance contracting services and the pool of qualified contractors. He directs several other PIER projects dealing with various energy efficiency challenges, ranging from market introduction of new lighting innovations to home performance protocols to HVAC technology innovation.

He has been responsible for numerous studies of both the market potential and adoption effects of new technologies and strategies for improving energy efficiency. For example, Dr. Knight helped prepare a business plan for PG&E's Commercial New Construction program and worked with the company to revise its energy efficiency market transformation strategy. Other past experience includes a broad range of consulting services to many EPRI programs in energy efficiency and other fields. He is the principal consultant to EPRI's CEO on development of a roadmap for the future of electricity in environmental service to society.

Dr. Knight is the officer in charge of BKi's current long-term technical support activities for organizations such as the California Fuel Cell Partnership in West

Sacramento, the EPA's vehicle emissions laboratory in North Carolina, and the California Air Resource Board's testing facilities in El Monte.

He is now completing leadership of the technology market connection effort on a $5 million Lighting Research Program for the California Energy Commission's PIER program, and assisting EPRI to develop a global vision and roadmap for mid-century electricity production and use to better meet pressing human needs.

Recently completed assignments include the direction of a PIER project to test and improve best practices in whole-house retrofits and the California Fuel Cell Partnership's commissioned study of the barriers and opportunities for earliest-possible mass market introduction of fuel cell vehicles under different fuel-source scenarios. Dr. Knight has been involved with Lawrence Berkeley Lab and DOE in various other technology roadmapping activities. He has also been responsible for studies of the market potential and adoption effects of such technologies as advanced heat pumps, evaporative space cooling, electric vehicles, and cluster housing.

Dr. Knight holds a Ph.D. in urban systems analysis and engineering from Northwestern University's Technological Institute. His other degrees include an M.S. in industrial engineering and management and a B.S. in civil engineering from the University of California at Berkeley.

Publications available upon request.

Eric Stern, BKi Technical Consultant
CBPCA Project Administrator

Mr. Stern's professional interests and consulting career focuses include the design and implementation of residential and small commercial energy efficiency programs for investor-owned utilities, public sector and non-profit clients. His experience involves managing both existing-home and new construction DSM market transformation programs and leading the introduction of energy-efficient technologies, concepts and practices into new markets. He has worked closely with all levels of stakeholders to communicate technical concepts to non-technical audiences, including client personnel and staff, homebuilders, energy raters, project partner organizations and consumers.

Mr. Stern earned an MBA from the University of Denver – Daniels College of Business and a B.S. degree in Civil and Environmental Engineering from UCLA. At Denver, he was named University of Denver's MBA Student of the Year.

Mr. Stern only recently joined BKi. Formerly he was a Senior Associate in ICF Consulting's Dallas office, where he led the design and implementation of the TXU Electric Delivery ENERGY STAR Homes Program for Dallas, Fort Worth, Austin and East Texas markets. By working closely with regional homebuilders and strategic allies, he implemented a successful effort to transform the single-family new home construction market by increasing both builder supply and

consumer demand for energy-efficient new homes. This program was twice named EPA's Utility Program of the Year (2002 & 2003).

ENERGY STAR Home Program Implementation details

- Delivered an estimated 100+ presentations, energy efficiency seminars and related ENERGY STAR program trainings
- Designed and led energy efficiency training of strategic partners such as area realtors, home energy raters, utility personnel and consumers
- Developed tiered incentives based on kW and kWh savings, web-based reporting and online tracking tools, advertising partnerships & co-ops
- Designed and directed an aggressive and successful ENERGY STAR homebuilder recruitment strategy
- Assisted the state's larger homebuilders with their transition towards compliance with the adoption of a statewide energy code (IECC 2000/IRC)
- Co-developed and managed a web-based reporting and tracking system
- Completed over 75+ builder and energy rater trainings on using the online system. Developed training materials and WebEx system protocols.

Additional ICF Projects

- Support provided for HVAC dealers and contractors installing high-efficiency units in new homes.
- Successfully recruited multifamily builders to install energy-efficient gas water heating systems.
- Recruited and supported large manufactured-home producers interested in constructing energy-efficient homes as part of an affordable housing program.

Prior to joining ICF, Mr. Stern was a Project Manager at Colorado Energy Science Center. CESC is a subsidiary of NREL (National Renewable Energy Laboratory). There he acted as a lead manager for energy efficiency & renewable energy project contracts, responsible for overseeing staff, consultants and project partners to ensure that deliverables were completed. Earlier affiliations included Q4 Associates & Union Station Transportation Development Company in Denver. With Q4, he co-authored an electric vehicle car-sharing feasibility study for downtown Denver, aimed at identifying potential strategic partners and analyzing the benefits & risks of a public/private partnership between local and regional agencies.

Mr. Stern was also an analyst for the Chilean American Chamber of Commerce in Santiago, authoring studies regarding the use of technology and the Internet by Latin American businesses, conducted statistical modeling/research on the impact of trade agreements with the U.S., developed market-entry strategies and export feasibility analyses for the chamber's corporate members. He was also witht the Institute for Business Assistance, Santa Barbara, CA as a strategy and project consultant focusing on start-up company launches for the IBA. Finally, in his earliest professional work he was a founding partner of Utilinet in Scottsdale, AZ, a smart-card technology based residential bill pay solution start-up for electricity retailers. There he developed a pilot project for Arizona Public Service

in which he devised business strategies, conducted energy industry research, discovered future business opportunities in soon-to-be deregulated energy markets, managed technical and legal teams.

Tim Locke, Quality Assured Comfort, Inc. (consultant to CBPCA)
Project Field Director/Trainer

Tim Locke is the Field Director and Lead Trainer of the current CBPCA whole-house retrofit program for the CPUC. He is a longtime leading California advocate and practitioner of scientific building performance assessment. He has over 27 years of successful private sector business experience with special emphasis on management, sales, marketing, education and training utilizing an integrated systems approach. For more than a decade he has focused on whole-building energy efficiency improvement, including the development and use of advanced diagnostic processes. That experience included the organization and management of private industry initiatives in whole-house remediation.

Mr. Locke's technical expertise covers the entire field of building diagnostics and remediation. This includes HVAC design, home energy ratings, building envelope infiltration testing, duct system leakage and efficiency testing, pressure differential diagnostics, combustion equipment safety testing, model energy code compliance modeling, computer simulation of building heat loss/gain for energy efficiency studies, and consulting**,** design and implementation of market transformation programs and studies.

Mr. Locke has also been a residential building contractor. His building remediation experience is extensive, including air infiltration and duct system leakage reduction, air and moisture flow balancing, water system improvements such as hot-recirculation and LFTs, application of energy efficient thermal coatings, design and installation of high performance building insulation systems, application of passive and active domestic solar hot water systems, exterior water conservation and drainage, and the design and application of bill disaggregation and program quality assurance/control models.

Mr. Locke has a deep background in systems management. This includes earlier positions in the financial services industry in which he developed and managed sales, analytical, fiscal, and administrative systems related to equipment leasing and other services. His understanding of economics, program finance, and management was later proven highly valuable in the energy efficiency field, particularly in his training and mentoring of contractors in appropriate business financial analysis principles and bid pricing practices.

Michael Gibbs, Senior Vice President, ICF Consulting
Project Manager for ICF Tasks

Mr. Gibbs is a Senior Vice President of ICF Consulting and is the Director of ICF Consulting's Los Angeles office. As Office Director, he is responsible for

supporting local and state public sector activities. Mr. Gibbs also directed ICF Consulting's analysis of water and energy issues for the U.S. EPA Climate Protection Partnerships Division. This work involved identifying the linkages between water and energy efficiency opportunities and examining approaches for leveraging the energy efficiency program infrastructure to promote water efficiency. Mr. Gibbs has also designed and managed programs to train contractors to promote efficient products and services. This work includes a promotional blitz involving HVAC contractors in PG&E's territory to accelerate the installation of high efficiency equipment during the energy crisis.

Mr. Gibbs has focused on developing and implementing local, regional, and national programs and policies in a broad range of environmental and energy issues. He has also traveled extensively in support of international programs, including training sessions in 15 countries. As Co-Chair of the IPCC Methane Working Group, Mr. Gibbs was responsible for leading an international team to develop national guidelines for emissions reporting programs.

Mr. Gibbs holds an M.P.P. degree from the John F. Kennedy School of Government, Harvard University, and a B.S. degree with University Honors, Civil Engineering and Engineering and Public Policy from Carnegie-Mellon University.

Examples of previous relevant experience include the following:

Water and Energy Efficiency: 2004. Under contract to the U.S. EPA, Mr. Gibbs led a research effort to identify and assess linkages between water and energy efficiency opportunities. This work included reviewing available data on programs and efficiency measures that affect both water and energy use, either directly or indirectly. Mr. Gibbs was lead author on the paper that resulted from this work: *Water and Energy: Leveraging Energy Efficiency Initiatives to Improve Water Use Efficiency*, Review Draft, December 14, 2004.

Small Commercial and Industrial HVAC and Lighting Demand Response Program: 2001 to 2004. Mr. Gibbs led the project team in the design and implementation of this program for the California Energy Commission (CEC). The program design identified the demand response technologies most appropriate for the small commercial sector, and evaluated alternative marketing approaches to promote the adoption of the technology. Mr. Gibbs developed the marketing strategy, including conducting a customer segmentation analysis and developing marketing materials and collateral. The program design was accepted and the program is currently being implemented by ICF Consulting to achieve 30 MW of load reduction.

California Residential Lighting and Appliance Program (CRLAP): 1999 to 2001. Mr. Gibbs led the CRLAP contractor team in developing the program design for 2000-2001. This work included identifying and leading research efforts into market conditions and market barriers. Specific technologies were identified and evaluated, and alternative market intervention strategies were assessed. Mr. Gibbs led the process for developing the marketing and communications strategy, which was designed to reach consumers statewide.

SCE 2000 Non-residential HVAC Contractor Incentive Program: 2000 to 2001. Mr. Gibbs led ICF Consulting's design of the HVAC Contractor Incentive Program for SCE. This work included defining the program marketing strategy and implementation procedures and processes, as well as identifying eligibility criteria for equipment and contractors. The program design was accepted and successfully implemented, exceeding program goals for product installations and energy efficiency savings.

Climate Change Action Plan: 1990 to 2004. Mr. Gibbs assisted in the design and implementation of a suite of programs to support the national and international objectives of the U.S. Climate Change Action Plan. This work included research, analysis, outreach, training, and tracking for a broad set of greenhouse gas emissions sources. Activities also focused on developing consensus among diverse stakeholder groups, and identifying key motivators for action.

Stratospheric Ozone Protection: 1984 to 1990. For the U.S. Environmental Protection Agency, Mr. Gibbs developed data and models to support the national and international objectives of the Stratospheric Ozone Protection Program. Mr. Gibbs conducted emissions inventories of ozone depleting substances (ODS) and quantified the costs and benefits of reducing emissions. To support the Agency's rulemaking, Mr. Gibbs contributed to the Risk Assessment and Environmental Impact Assessment of domestic and international emission control programs. Mr. Gibbs was a rapporteur at international consensus building workshops leading up to the signing and ratification of the Montreal Protocol and the London Amendments, both of which control ODS internationally.

Publications available upon request.

Matt Morris, Associate, ICF Consulting
ICF Task Analyst

Mr. Morris is an associate consultant with ICF Consulting in Los Angeles. Most recently, Mr. Morris contributed to the assessment of water and energy efficiency opportunities, focusing on the linkages among programs and measures that affect both resources. During three years as an application consultant, Mr. Morris gained practical business knowledge through extensive project management, sales and marketing, and application development experience. These capabilities have been successfully displayed during a number of both technical and management consulting engagements.

Mr. Morris holds an M.S. degree in Policy and Management, H.J. Heinz School of Public Policy and Management at Carnegie Mellon University, and a B.S. degree in Political Science and Industrial Management, Carnegie Mellon University.

Previous relevant experience examples include the following:

Water and Energy Efficiency: 2004. Under contract to the U.S. EPA, Mr. Morris provided research and writing support on a project that assessed linkages between water and energy efficiency opportunities. This work included obtaining

research reports and analyzing efficiency opportuninties and measures. Mr. Morris contributed to the paper that resulted from this work: *Water and Energy: Leveraging Energy Efficiency Initiatives to Improve Water Use Efficiency*, Review Draft, December 14, 2004.

Small Commercial and Industrial HVAC and Lighting Demand Response Program, California Energy Commission, 2003 – 2004. The program provided incentives to customers in California with peak electric demand between 50kW to 200kW, encouraging the curtailment of their peak loads, both in response to system emergencies and on a permanent basis. Mr. Morris assisted customers in both applying for and organizing their project responsibilities. Additionally, Mr. Morris was been involved in the analysis of the load and curtailment data used to determine the financial reward payments through the program.

SalesLogix Customer Relationship Management Implementations, Sales and Marketing Divisions, 2001 – 2003. The *SalesLogix* Customer Relationship Management application has been implemented for a wide variety of industries, to suit their varying sales force automation requirements. Mr. Morris served as project manager and developed plans for several *SalesLogix* implementations. Mr. Morris was also responsible for technical project tasks including the design and customization of screen views, as well as the development of comprehensive, end-user training manuals based on specific business processes.

Shared Services Initiative, Mid-Market Metals Manufacturing, 2000 – 2001. The Shared Services Initiative was a company re-organization and process standardization for a mid-market metals manufacturing company. The projects' deliverables included procedural mapping and recommendations for centralization and re-engineering within the areas of Financials, Marketing, Sales Order Entry, Credit, Operations, and Human Resources. Mr. Morris was the team lead and primary project resource for all phases of the Shared Services Initiative, responsible for the project design, business process mapping, and interviewing end-users to identify requirements. Mr. Morris also prepared and presented status updates to top level executives, organized and led weekly steering committee meetings and maintained the project website.

David Meisegeier, Project Manager, ICF Consulting
ICF Task Leader

Mr. Meisegeier is a Project Manager at ICF Consulting with 12 years of experience in energy efficiency, indoor environmental quality (IEQ), and pollution prevention for the residential sector. His professional skills include: design and implementation of strategic energy efficiency and demand reduction programs; market and technology assessments of energy efficient products and systems; and information technology development. Mr. Meisegeier currently leads a team of energy analysts, marketers, account managers, communications specialists, and trainers. This team provides full-service support to the EPA's voluntary ENERGY STAR market transformation programs (including the ENERGY STAR

for Homes program) as well as to many other private clients and trade organizations. Mr. Meisegeier has a Bachelors degree in Architectural Engineering from Pennsylvania State University and a Masters degree in Engineering Management from George Washington University.

Some of Mr. Meisegeier's relevant past and current assignments include:

ENERGY STAR for Homes Partner Account Management and Services, U.S. EPA, 2001 to Present. Mr. Meisegeier is currently leading a team of account managers responsible for implementing EPA's ENERGY STAR for Homes program. This voluntary program has an aggressive goal of transforming the U.S. housing market to energy efficient construction. To achieve this goal, the implementation team provides marketing, sales, and technical support services to builders, their subcontractors, and broader industry stakeholders including Home Energy Raters, mortgage lenders, utilities and product manufacturers. Specific activities include developing regional strategic plans; identifying, recruiting and cultivating program champions in local markets; building and fostering strategic alliances between partners; conducting and/or facilitating meetings, seminars and workshops; and developing tools and materials to strengthen the recruiting and account management efforts.

ENERGY STAR Home Improvement Technical Support, U.S. EPA, 2003 to Present. Mr. Meisegeier manages a team that provides support for the U.S. EPA's voluntary initiatives to encourage homeowners to make cost effective energy efficiency improvements to their existing homes. ICF assists EPA's Home Improvement team in program development and implementation efforts focused on ENERGY STAR Home Sealing, Duct Sealing, Home Performance with ENERGY STAR, and other "whole house" improvement strategies including heating and cooling system installation and performance. Specific activities include marketing and sales outreach to encourage participation from contractors, utilities, retailers, and regional implementers; developing target market reports focused on identifying potential participants, state and utility programs, and other relevant groups to gauge interest and capabilities of home improvement service providers; recruiting and outreach trips to target areas including regional home shows or seminars; coordinating and meeting with local participants and promoting ENERGY STAR home improvement to consumers; assisting EPA in the development and design of home improvement programs by evaluating feasibility and benefits of various initiatives for different regions and markets; interviewing industry leaders in energy efficiency improvements and preparing case studies; preparing and reviewing technical content and specifications for the various initiatives.

ENERGY STAR Financing, U.S. EPA, 2003 to Present. Mr. Meisegeier oversees a team that provides analytical, research, and logistical support for EPA's ENERGY STAR Financing program. This program supports program development and implementation for the ENERGY STAR for Homes, ENERGY STAR Home Improvement, and ENERGY STAR Labeled Products (e.g., HVAC) Programs. Activities include conducting research into possible financing products to assist home buyers and home owners to purchase ENERGY STAR

labeled homes, make energy efficient home improvements, and purchase labeled HVAC products; developing materials for both EPA and ENERGY STAR lenders; and providing logistical support to promote ENERGY STAR Financing.

ENERGY STAR for Homes Marketing and Product Development, U.S. EPA, 1999 to 2002. Mr. Meisegeier led a team responsible for the development and distribution of marketing and educational materials for EPA's ENERGY STAR Labeled Homes. Activities include developing and maintaining content on the program's Web sites as well as developing fact sheets, software, sales training, case studies and information packs for both electronic and hard copy distribution. Activities also include: working and coordinating with Rating Providers on modifying their home energy rating tools to be compatible with EPA's and answering program and certificate questions from program participants.

Home Benchmark Implementation Technical Support for EPA's Home Improvement Program, U.S. EPA, 2001. Mr. Meisegeier managed a work assignment to provide EPA implementation support for their Home Benchmark tool, a key component of their Home Improvement Program. Activities included identifying and evaluating potential opportunities and obstacles of implementing the benchmarking tool in the existing residential housing market. Perspectives of all interested parties (e.g., home owners, home energy raters, utilities, mortgage lenders) were examined to maximize the effectiveness of this tool.

Technical Support for the ENERGY STAR for Homes, U.S. EPA, 1997 – present. Mr. Meisegeier leads a team that provides detailed technical support to the ENERGY STAR for Homes program. Support also includes energy modeling, developing best practice upgrade recommendations and developing builder option packages (BOPs).

Home Energy Ratings (HERS) Support for the ENERGY STAR Homes Program, U.S. EPA, 1997. Mr. Meisegeier performed HERS ratings for a number of builders to assess the level of energy efficiency of their construction. Activities included floor plan reviews, on site collection of data, diagnostic testing of the air tightness of the house and ducts, modeling the houses in DOE-2, writing home energy ratings showing energy and cost impacts, and discussing the findings with the builders to ensure understanding.

Cofunding Confirmation and Required Project Cost Form

(following pages)

- Letter from David Lee, Director, EPA Energy Star Residential Office
- Appendix C, Table C-1: Project Cost Estimates

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

OFFICE OF AIR AND RADIATION

Climate Protection Partnership Division
U.S. EPA 6202J
Washington, DC 20460

This letter is to commit financial support to the California Building Performance Contracting Association's (CBPCA) proposal submitted to the Office of Water Use Efficiency at the California Department of Water Resources. CBPCA is submitting a proposal in response to the "Water Use Efficiency Proposal Solicitation Package" dated September 30, 2004.

EPA intends to provide $20,000 in support of this project if funding is received from the California Department of Water Resources to support CBPCA. EPA would provide this funding through a contract vehicle with ICF, a sub-contractor to this proposal.

EPA has worked with the CBPCA over the last several years to promote whole house retrofits to improve the overall comfort, durability and health and safety of homes. Many of these benefits are achieved through improvements made to the overall energy efficiency of the home, and careful monitoring of any adverse indoor air problems that may result from these improvements. EPA's national program template is called "Home Performance with ENERGY STAR" and includes a home inspection, recommended improvements, improvements performed, and a post-inspection to ensure quality workmanship. The CBPCA is currently running a version of this model program, providing essential lessons for EPA and other states which are developing similar programs.

EPA has become interested in including water efficiency as part of Home Performance with ENERGY STAR. Water efficiency improvements could be readily identified at the time that energy audits are performed, and improvements for both water and energy could be done at the same time, providing "one stop shopping" for the homeowner and reducing total delivery costs.

EPA believes that the California Department of Water Resources request for proposals provides an excellent opportunity to merge residential water efficiency with the CBPCA's ongoing program to improve the overall energy efficiency of existing homes. If you should have any questions, I may be reached at 202-343-9131.

Sincerely,

David Lee, Director
Energy Star Residential Branch

APPENDIX C
PROJECT IMPLEMENTATION COSTS TABLE

APPLICANT: California Building Performance Contractors Association
Project Title: Integrated Home Water Savings with Energy Star

Table C-1: Project Costs (Budget)

	Category	Project Costs $	Contingency % (ex. 5 or 10)	Project Cost + Contingency $	Applic't Share $	State Share $	Life of investmnt (Years)	Capital Recovery Factor (Table C-4)	Annualized costs $
	(I)	*(II)*	*(III)*	*(IV)*	*(V)*	*(VI)*	*(VII)*	*(VIII)*	*(IX)*
	Administration (for initiation of project)								
	Salaries, wages	0	0	0					
	Fringe benefits	0	0	0					
	Supplies	0	0	0					
	Equipment	0	0	0					
	Consulting services	110,878	0	110,878					
	Travel	3,800	0	3,800					
	Other	3,025	0	3,025					
(a)	Total Admin Costs[1]	117,703	0	117,703					
(b)	Planning/Design/ Engineering	24,185	0	24,185					
(c)	Equip Purch/ Rent/ Rebates/ Vouchers	0	0	0					
(d)	Materials/Installation /Implementation	312,918	0	312,918	20,000				
(e)	Implementation Verification	18,260	0	18,260					
(f)	Project Legal/ License Fees	0	0	0					
(g)	Monitoring and Assessment	67,150	0	67,150					
(h)	Report Preparation	48,686	0	48,686					
(i)	Structures	0	0	0					
(j)	Land Purch/ Easmt	0	0	0					
(k)	Environmental Compliance/Mitigation/Enhancement	0	0	0					
(l)	Construction	0	0	0					
(m)	Other (Specify)	0	0	0					
(n)	TOTAL (=a+…+m)	588,902	NA	588,902	20,000	568,902	NA	NA	NA (SectionB)
(o)	Cost Share Percentage	NA	NA	NA	3.4%	96.6%	NA	NA	NA

1 (Excludes administration O & M costs)