

Exhibit A
SCOPE OF WORK

TECHNICAL TASK LIST

Task #	CPR	Task Name
Administration		Program Administration
Task A.1		Attend Kick-off Meeting
Task A.2		CPR Meetings
Task A.3		Final Meeting
Task A.4		Monthly Progress Reports
Task A.5		Test Plans, Technical Reports and Interim Deliverables
Task A.6		Final Report
Task A 6.1		Final Report Outline
Task A 6.2		Final Report
Task A.7		Identify and Obtain Match Funds
Task A.8		Identify and Obtain Required Permits
Task A.9		Electronic File Format
Project 1		Market Research & Outreach Project
Task 1.1		Develop Subdivision Screening Tool
Task 1.2		Draft Marketing Plan
Task 1.3		Develop Draft Marketing Materials
Task 1.4		Test Preliminary Marketing Materials
Task 1.5		Refine Draft Marketing Materials and Plan
Task 1.6	X	Analyze Results of Demonstration Project and Refine Marketing Approach
Task 1.7		Develop and Present Outreach Presentation
Project 2		Residential Retrofit Demonstration Project Design
Task 2.1		Develop Sales Infrastructure
Task 2.2		Develop Tracking System
Task 2.3		Summarize Legal Issues and Resolutions
Task 2.4		Summarize Financial Options
Task 2.5		Contractor Selection Process
Task 2.6		Develop Preliminary Retrofit Procedures and Packages
Project 3		Curriculum Development and Training
Task 3.1		Summarize Contractor Training Curriculum
Task 3.2		Co-Sponsor Training for Contractors
Task 3.3	X	Develop Retrofit Installation Curriculum
Task 3.4		Conduct Training for Contractors and Installers on Specific Retrofit Packages
Project 4		Residential Retrofit Demonstration Project
Task 4.1		Large Scale Residential Retrofit Demonstration
Task 4.1.1		Refine Retrofit Package Design
Task 4.1.2		Develop Installation and QA/QC Procedures
Task 4.1.3		Marketing and Sales
Task 4.1.4		Implement and Manage Retrofit

Task #	CPR	Task Name
Task 4.1.5		Complete Monitoring & Verification
Task 4.1.6		Prepare Demonstration Project Report
Task 4.2		Deep Retrofit Demonstration
Task 4.3		Analyze and Disseminate Results

KEY NAME LIST

Task #	Key Personnel	Key Subcontractor(s)	Key Partner(s)
Task A.1- 9	Mark Berman		
Task 1.1- 1.2	Mark Berman, Pepper Smith, Greg Stine, Mark Fischer	Polaris, Inc., Grupe Homes	
Task 1.3	Mark Berman, Pepper Smith, Greg Stine, Bob Knight, Mark Fischer	Polaris, Inc., Bevilacqua Knight, Inc., Grupe Homes, Vicki Mongan	
Task 1.4	Mark Berman, Pepper Smith, Greg Stine, Bob Knight, Mark Fischer	Polaris, Inc., BKi, Grupe Homes	
Task 1.5 – 1.7	Mark Berman, Pepper Smith, Greg Stine, Bob Knight	Polaris, Inc., BKi	
Task 2.1	Mark Berman, Pepper Smith, Greg Stine, Patrick Bell, Mark Fischer	Polaris, Grupe Homes	Patrick C. Bell & Co., Advanced Energy Products
Task 2.2	Mark Berman, Pepper Smith, Greg Stine	Polaris	
Task 2.3	Mark Berman, Pepper Smith, Louise Adamson		K&L Gates
Task 2.4	Mark Berman, Pepper Smith, Greg Stine, Bob Knight, Mark Fischer, Louise Adamson	Polaris, BKi, Grupe Homes	K&L Gates
Task 2.5	Mark Berman, Pepper Smith, Bob Knight, Louise Adamson	BKi	K&L Gates, Advanced Energy Products
Task 2.6	Mark Berman, Pepper Smith, Mark Fischer	Grupe Homes	
Task 3.1	Pepper Smith, Bob Knight, Russ King	BKi, SBSI	CBPCA
Task 3.2	Pepper Smith, Bob Knight, Russ King	BKi, SBSI	CBPCA

Task #	Key Personnel	Key Subcontractor(s)	Key Partner(s)
Task 3.3-3.4	Pepper Smith, Russ King	SBSI	CBPCA
Task 4.1	Mark Berman, Pepper Smith, Greg Stine, Bob Knight, Mark Fischer	Polaris, BKi, Grupe Homes	City of Stockton
Task 4.1.1	Mark Berman, Bill Dakin		
Task 4.1.2	Mark Berman, Pepper Smith, Mark Fischer	Grupe Homes	
Task 4.1.3	Mark Berman, Pepper Smith, Greg Stine, Bob Knight, Mark Fischer	Polaris, BKi, Grupe Homes	City of Stockton
Task 4.1.4	Mark Berman, Pepper Smith, Mark Fischer	Grupe Homes	
Task 4.1.5	Mark Berman, Pepper Smith		
Task 4.1.6	Mark Berman, Pepper Smith, Greg Stine, Bob Knight, Mark Fischer	Polaris, BKi, Grupe Homes	
Task 4.2	Mark Berman, Pepper Smith, Mark Fischer	Grupe Homes	
Task 4.3	Mark Berman, Pepper Smith, Greg Stine	Polaris	

GLOSSARY

Specific terms and acronyms used throughout this work statement are defined as follows:

Acronym	Definition
AB 811	Assembly Bill 811 2008, Levine
AB 32	Assembly Bill 32 ,2006 Nunez
ACEEE	American Council for an Energy Efficient Economy
ACI	Affordable Comfort, Inc.
BEopt	Building Energy Optimization (software)
BKi	Bevilacqua Knight, Inc.
BPI	Building Performance Institute
CBPCA	California Building Performance Contractors Association
CO ₂	Carbon Dioxide
CPR	Critical Project Review
CPUC	California Public Utilities Commission
DEG	Davis Energy Group
Energy Commission	California Energy Commission

Acronym	Definition
GHG	Greenhouse Gas
GIS	Geographical Information System
GWH	Giga Watt Hours
HERS	Home Energy Rating System
HVAC	Heating Ventilation and Air Conditioning
Kg/MWH	Kilogram/Mega Watt Hours
kW	Kilo Watt
kWh	Kilo Watt Hours
LEED	Leadership in Energy and Environmental Design
LSRRP	Large Scale Residential Retrofit Program
MW	Mega Watt
MWH	Mega Watt Hours
PACE	Property Assessed Clean Energy
PV	Photo Voltaic
PG&E	Pacific Gas & Electric Company
PIER	Public Interest Energy Research
QA/QC	Quality Assurance/Quality Control
SBSI	Sierra Building Science, Inc.
Title 24	California Code Regulation Title 24 California Building Standards
UCC.1	Uniform Commercial Code (Financing Statement)

Problem Statement

The Large Scale Residential Retrofit Program (LSRRP) is an integrated program of projects designed to create and demonstrate a roadmap for completing large numbers of integrated residential retrofits. The LSRRP will develop retrofit designs based upon building science principles. It will include training, quality control regimen, and competitive financing.

While there are various entities around the state that offer custom home retrofits, no one has demonstrated how to retrofit the number of homes needed each year to meet the green house gas (GHG) emission reduction goals. This program will create two sub-plans, the first a roadmap for achieving scale in what is now a highly fragmented, custom business, and the second for custom homes. These sub-plans will take advantage of economies of scale where feasible while ensuring that all homeowners have an opportunity to participate in a retrofit program.

The LSRRP is all about connections to the market. There is an unlimited potential of residential retrofits and the need to break the barriers that stand between the existing housing stock and energy efficiency. The LSRRP will demonstrate how to integrate the many variables involved in a home retrofit so that energy retrofits can be efficiently designed and installed by any one entity, making it easy for the homeowners to adopt. The program will also demonstrate how economies of scale and large volume can be leveraged to reduce the costs of residential retrofits. This promises to unlock the vast potential for residential retrofits, providing Californians with lower utility bills, better indoor air quality, and reduced GHG emissions.

Currently, many market barriers prevent residential energy retrofits. Foremost are the economic payback of energy retrofits and the longevity of home ownership. The enactment of AB 811 holds promise to solve this market barrier.

However, nearly all of these programs are primarily focused on the financial barrier and are dependent upon trusting contractors, hopefully trained in whole-house retrofits by the California Building Performance Contractors Association (CBPCA) or others. This approach leaves the application of building science to chance. What is needed is a scalable business model that integrates whole-house retrofits and makes them easier to obtain and more affordable.

Goals of the Agreement

The goal of this Agreement is to demonstrate that a coordinated program of projects designed to complete large numbers of integrated residential retrofits is cost effective and will generate significant GHG emission reductions. The LSRRP will develop retrofit designs based upon building science principles. It will include training, a quality control regimen, and competitive financing.

Objectives of the Agreement

To estimate the impacts of the LSRRP, the problem should be split into two categories: houses that will actually receive retrofits through the efforts of the LSRRP; and houses that are likely to benefit by the aftereffects of a successful demonstration program. To estimate the benefits of the proposed project in California, a simulation program using Building Energy Optimization (BEopt), was used to determine savings for a typical home built in 1990s, of approximately 1,800 square feet in climate Zone 12, to exceed California Energy Commission's Title 24 Building Standards. The BEopt program was developed by the National Renewable Energy Laboratory to generate optimal energy efficient program designs based on benchmark assumptions, efficiency measure cost data, and local climate data.

Three "packages" of energy efficiency measures were developed based on the BEopt analysis of the example house. The first package includes window film, attic insulation, weatherization, duct tightening, and lighting upgrades; the second adds an air conditioner retrofit; the third adds a Photo Voltaic (PV) system and other upgrades. In developing savings estimates, 50% of the sites were assumed to select package 2, with the remaining 50% split equally between packages 1 and 3. Projected average household savings was 5,445 kilo watt hours (kWh)/year (52%), 1.04 kilo watt (kW) peak demand reduction (59%), and 57 therms/year (6%). Cumulative impacts for the assumed 500-unit demonstration project total:

- 2,723 mega watt hours (MWH)/year energy savings;
- 520 kW peak demand reduction;
- Natural gas savings of 28,250 therms annually;
- Annual greenhouse gas carbon dioxide (CO₂) reductions of 1007 metric tons¹.

¹ Based on CO₂ estimates of 313 kg/MWH saved and 12.0583 lbs/therm of natural gas saved.

Of the 13 million California households, a market potential of 2.064 million single family homes are estimated. This estimation excludes homes without air conditioners, rental homes, recently remodeled homes, and low cooling energy users. The assumption was made that this segment of California households consumes 60% of the 5,797 Giga Watt Hours (GWH)/year of residential air conditioning, amounting to an average of 1,685 kWh/year of air conditioning per household. Similarly, the 2.064 million single family homes were assumed to represent 40% of the 9,043 mega watt (MW) of statewide air conditioning demand resulting in a base case household cooling demand of 1.75 kW.² Applying the percentage savings determined in the BEopt analysis, the technical potential of affecting these 2 million homes totals:

- 6,775 GWH/year (7.8% reduction of residential energy);
- 2,148 MW peak demand reduction (10.7% reduction of residential peak demand)
- Natural gas savings of 50 million therms annually (0.9% reduction of residential gas usage)
- Annual GHG, CO₂ reductions of 2.4 million metric tons.

The proposed project offers non-energy benefits as well as energy benefits. As utility rate increases become more commonplace, the effect of utility bills on household budgets becomes increasingly significant, affecting both housing affordability and homeowner discretionary spending. Lowering utility bills through a comprehensive, cost-effective retrofit program will have a positive benefit on housing affordability, as well as the broader California economy. The creation of “green collar” jobs will also help the State’s economy. A successful demonstration project will provide a solid foundation for future statewide efforts in targeting the important residential retrofit market.

TASK 1.0 ADMINISTRATION

MEETINGS

Task A.1 Attend Kick-off Meeting

The goal of this task is to establish the lines of communication and procedures for implementing this Agreement.

The Contractor shall:

- Attend a “kick-off” meeting with the Commission Contract Manager, the Contracts Officer, and a representative of the Accounting Office. The Contractor shall bring their Project Manager, Contracts Administrator, Accounting Officer, and others designated by the Commission Contract Manager to this meeting. The administrative and technical aspects of this Agreement will be discussed at the meeting. Prior to the kick-off meeting, the Commission Contract Manager will provide an agenda to all potential meeting participants.

² The demand impact is logically smaller than the energy impact, since low cooling energy users are more likely to operate their air conditioner on the peak summer day than on a typical summer day.

The administrative portion of the meeting shall include, but not be limited to, the following:

- Terms and conditions of the Agreement
- CPRs (Task 1.2)
- Match fund documentation (Task 1.7)
- Permit documentation (Task 1.8)

The technical portion of the meeting shall include, but not be limited to, the following:

- The Commission Contract Manager's expectations for accomplishing tasks described in the Scope of Work;
- An updated Schedule of Deliverables
- Progress Reports (Task 1.4)
- Technical Deliverables (Task 1.5)
- Final Report (Task 1.6)

The Commission Contract Manager shall designate the date and location of this meeting.

Contractor Deliverables:

- An Updated Schedule of Deliverables
- An Updated List of Match Funds
- An Updated List of Permits

Commission Contract Manager Deliverables:

- Final Report Instructions

Task A.2 CPR Meetings

The goal of this task is to determine if the project should continue to receive Energy Commission funding to complete this Agreement and if it should, are there any modifications that need to be made to the tasks, deliverables, schedule or budget.

CPRs provide the opportunity for frank discussions between the Energy Commission and the Contractor. CPRs generally take place at key, predetermined points in the Agreement, as determined by the Commission Contract Manager and as shown in the Technical Task List above and in the Schedule of Deliverables. However, the Commission Contract Manager may schedule additional CPRs as necessary, and any additional costs will be borne by the Contractor.

Participants include the Commission Contract Manager and the Contractor, and may include the Commission Contracts Officer, the PIER Program Team Lead, other Energy Commission staff and Management as well as other individuals selected by the Commission Contract Manager to provide support to the Energy Commission.

The Commission Contract Manager shall:

- Determine the location, date and time of each CPR meeting with the Contractor.

These meetings generally take place at the Energy Commission, but they may take place at another location.

- Send the Contractor the agenda and a list of expected participants in advance of each CPR. If applicable, the agenda shall include a discussion on both match funding and permits.
- Conduct and make a record of each CPR meeting. One of the outcomes of this meeting will be a schedule for providing the written determination described below.
- Determine whether to continue the project, and if continuing, whether or not to modify the tasks, schedule, deliverables and budget for the remainder of the Agreement, including not proceeding with one or more tasks. If the Commission Contract Manager concludes that satisfactory progress is not being made, this conclusion will be referred to the Energy Commission's Research, Development and Demonstration Policy Committee for its concurrence.
- Provide the Contractor with a written determination in accordance with the schedule. The written response may include a requirement for the Contractor to revise one or more deliverable(s) that were included in the CPR.

The Contractor shall:

- Prepare a CPR Report for each CPR that discusses the progress of the Agreement toward achieving its goals and objectives. This report shall include recommendations and conclusions regarding continued work of the projects. This report shall be submitted along with any other deliverables identified in this Scope of Work. Submit these documents to the Commission Contract Manager and any other designated reviewers at least 15 working days in advance of each CPR meeting.
- Present the required information at each CPR meeting and participate in a discussion about the Agreement.

Contractor Deliverables:

- CPR Report(s)
- CPR deliverables identified in the Scope of Work

Commission Contract Manager Deliverables:

- Agenda and a List of Expected Participants
- Schedule for Written Determination
- Written Determination

Task A.3 Final Meeting

The goal of this task is to closeout this Agreement.

The Contractor shall:

- Meet with the Energy Commission to present the findings, conclusions, and recommendations. The final meeting must be completed during the closeout of this Agreement.

This meeting will be attended by, at a minimum, the Contractor, the Commission Contracts Officer, and the Commission Contract Manager. The technical and administrative aspects of Agreement closeout will be discussed at the meeting, which may be two separate meetings at the discretion of the Commission Contract Manager.

The technical portion of the meeting shall present findings, conclusions, and recommended next steps (if any) for the Agreement. The Commission Contract Manager will determine the appropriate meeting participants.

The administrative portion of the meeting shall be a discussion with the Commission Contract Manager and the Contracts Officer about the following Agreement closeout items:

- What to do with any state-owned equipment (Options)
 - Need to file UCC.1 form re: Energy Commission's interest in patented technology
 - Energy Commission's request for specific "generated" data (not already provided in Agreement deliverables)
 - Need to document Contractor's disclosure of "subject inventions" developed under the Agreement
 - "Surviving" Agreement provisions, such as repayment provisions and confidential deliverables
 - Final invoicing and release of retention
- Prepare a schedule for completing the closeout activities for this Agreement.

Deliverables:

- Written documentation of meeting agreements and all pertinent information
- Schedule for completing closeout activities

REPORTING

See Exhibit D, Reports/Deliverables/Records.

Task A.4 Monthly Progress Reports

The goal of this task is to periodically verify that satisfactory and continued progress is made towards achieving the research objectives of this Agreement.

The Contractor shall:

- Prepare progress reports which summarize all Agreement activities conducted by the Contractor for the reporting period, including an assessment of the ability to complete the Agreement within the current budget and any anticipated cost overruns. Each progress report is due to the Commission Contract Manager within 10 working days after the end of the reporting period. Attachment A-2, Progress Report Format, provides the recommended specifications.

Deliverables:

- Monthly Progress Reports

Task A.5 Test Plans, Technical Reports and Interim Deliverables

The goal of this task is to set forth the general requirements for submitting test plans, technical reports and other interim deliverables, unless described differently in the Technical Tasks. When creating these deliverables, the Contractor shall use and follow, unless otherwise instructed in writing by the Commission Contract Manager, the latest version of the PIER Style Manual published on the Energy Commission's web site:

<http://www.energy.ca.gov/contracts/pier/contractors/index.html>

The Contractor shall:

- Unless otherwise directed in this Scope of Work, submit a draft of each deliverable listed in the Technical Tasks to the Commission Contract Manager for review and comment in accordance with the approved Schedule of Deliverables. The Commission Contract Manager will provide written comments back to the Contractor on the draft deliverable within 20 working days of receipt. Once agreement has been reached on the draft, the Contractor shall submit the final deliverable to the Commission Contract Manager. The Commission Contract Manager shall provide written approval of the final deliverable within 10 working days of receipt. Key elements from this deliverable shall be included in the Final Report for this project.

Task A.6 Final Report

The goal of this task is to prepare a comprehensive written Final Report that describes the original purpose, approach, results and conclusions of the work done under this Agreement. The Commission Contract Manager will review and approve the Final Report. The Final Report must be completed on or before the termination date of the Agreement. When creating these deliverables, the Contractor shall use and follow, unless otherwise instructed in writing by the Commission Contract Manager, the latest version of the PIER Style Manual published on the Energy Commission's web site:

<http://www.energy.ca.gov/contracts/pier/contractors/index.html>

The Final Report shall be a public document. If the Contractor has obtained confidential status from the Energy Commission and will be preparing a confidential version of the

Final Report as well, the Contractor shall perform the following subtasks for both the public and confidential versions of the Final Report.

Task A.6.1 Final Report Outline

The Contractor shall:

- Prepare a draft outline of the Final Report.
- Submit the draft outline of Final Report to the Commission Contract Manager for review and approval. The Commission Contract Manager will provide written comments back to the Contractor on the draft outline within 10 working days of receipt. Once agreement has been reached on the draft, the Contractor shall submit the final outline to the Commission Contract Manager. The Commission Contract Manager shall provide written approval of the final outline within 5 working days of receipt.

Deliverables:

- Draft Outline of the Final Report
- Final Outline of the Final Report

Task A.6.2 Final Report

The Contractor shall:

- Prepare the draft Final Report for this Agreement in accordance with the approved outline.
- Submit the draft Final Report to the Commission Contract Manager for review and comment. The Commission Contract Manager will provide written comments within 10 working days of receipt.

Once agreement on the draft Final Report has been reached, the Commission Contract Manager shall forward the electronic version of this report for Energy Commission internal approval. Once the approval is given, the Commission Contract Manager shall provide written approval to the Contractor within 5 working days.

- Submit one bound copy of the Final Report with the final invoice.

Deliverables:

- Draft Final Report
- Final Report

MATCH FUNDS, PERMITS, AND ELECTRONIC FILE FORMAT

Task A.7 Identify and Obtain Matching Funds

The goal of this task is to ensure that the match funds planned for this Agreement are obtained for and applied to this Agreement during the term of this Agreement.

The costs to obtain and document match fund commitments are not reimbursable through this Agreement. While the PIER budget for this task will be zero dollars, the Contractor may utilize match funds for this task. Match funds shall be spent concurrently or in advance of PIER funds during the term of this Agreement. Match funds must be identified in writing, and the associated commitments obtained before the Contractor can incur any costs for which the Contractor will request reimbursement.

The Contractor shall:

- Prepare a letter documenting the match funding committed to this Agreement and submit it to the Commission Contract Manager at least 2 working days prior to the kick-off meeting:
 1. If no match funds were part of the proposal that led to the Energy Commission awarding this Agreement and none have been identified at the time this Agreement starts, then state such in the letter.
 2. If match funds were a part of the proposal that led to the Energy Commission awarding this Agreement, then provide in the letter:
 - A list of the match funds that identifies the:
 - Amount of each cash match fund, its source, including a contact name, address and telephone number and the task(s) to which the match funds will be applied.
 - Amount of each in-kind contribution, a description, documented market or book value, and its source, including a contact name, address and telephone number and the task(s) to which the match funds will be applied. If the in-kind contribution is equipment or other tangible or real property, the Contractor shall identify its owner and provide a contact name, address and telephone number, and the address where the property is located.
 - A copy of the letter of commitment from an authorized representative of each source of cash match funding or in-kind contributions that these funds or contributions have been secured.
- Discuss match funds and the implications to the Agreement if they are significantly reduced or not obtained as committed, at the kick-off meeting. If applicable, match funds will be included as a line item in the progress reports and will be a topic at CPR meetings.
- Provide the appropriate information to the Commission Contract Manager if during the course of the Agreement additional match funds are received.

- Notify the Commission Contract Manager within 10 working days if during the course of the Agreement existing match funds are reduced. Reduction in match funds must be approved through a formal amendment to the Contract and may trigger an additional CPR.

Deliverables:

- A letter regarding Match Funds or stating that no Match Funds are provided
- Letter(s) for New Match Funds
- A copy of each Match Fund commitment letter
- Letter that Match Funds were Reduced (if applicable)

Task A.8 Identify and Obtain Required Permits

The goal of this task is to obtain all permits required for work completed under this Agreement in advance of the date they are needed to keep the Agreement schedule on track.

Permit costs and the expenses associated with obtaining permits are not reimbursable under this Agreement. While the PIER budget for this task will be zero dollars, the Contractor shall show match funds for this task. Permits must be identified in writing and obtained before the Contractor can incur any costs related to the use of the permits for which the Contractor will request reimbursement.

The Contractor shall:

- Prepare a letter documenting the permits required to conduct this Agreement and submit it to the Commission Contract Manager at least 2 working days prior to the kick-off meeting:
 1. If there are no permits required at the start of this Agreement, then state such in the letter.
 2. If it is known at the beginning of the Agreement that permits will be required during the course of the Agreement, provide in the letter:
 - A list of the permits that identifies the:
 - Type of permit
 - Name, address and telephone number of the permitting jurisdictions or lead agencies
 - Schedule the Contractor will follow in applying for and obtaining these permits.
- The list of permits and the schedule for obtaining them will be discussed at the kick-off meeting, and a timetable for submitting the updated list, schedule and the copies of the permits will be developed. The implications to the Agreement if the permits are not obtained in a timely fashion or are denied will also be discussed. If

applicable, permits will be included as a line item in the progress reports and will be a topic at CPR meetings.

- If during the course of the Agreement additional permits become necessary, then provide the appropriate information on each permit and an updated schedule to the Commission Contract Manager.
- As permits are obtained, send a copy of each approved permit to the Commission Contract Manager.
- If during the course of the Agreement permits are not obtained on time or are denied, notify the Commission Contract Manager within 5 working days. Either of these events may trigger an additional CPR.

Deliverables:

- A letter documenting the Permits or stating that no Permits are required
- Updated list of Permits as they change during the Term of the Agreement
- Updated schedule for acquiring Permits as it changes during the Term of the Agreement
- A copy of each approved Permit

Task A.9 Electronic File Format

The goal of this task is to unify the formats of electronic data and documents provided to the Energy Commission as contract deliverables. Another goal is to establish the computer platforms, operating systems and software that will be required to review and approve all software deliverables.

The Contractor shall:

- Deliver documents to the Commission Contract Manager in the following formats:
 - Data sets shall be in Microsoft (MS) Access or MS Excel file format.
 - PC-based text documents shall be in MS Word file format.
 - Documents intended for public distribution shall be in PDF file format, with the native file format provided as well.
 - Project management documents shall be in MS Project file format.
- Request exemptions to the electronic file format in writing at least 90 days before the deliverable is submitted.

Deliverables:

- A letter requesting exemption from the Electronic File Format (if applicable)

TECHNICAL TASKS

The Contractor shall prepare all deliverables in accordance with the requirements in Task A.5. Deliverables not requiring a draft version are indicated by marking “(no draft)” after the deliverable name.

Project 1 Market Research & Outreach Project

The goal of this project is to design, revise, and finalize a set of marketing materials and marketing plans for use in the Demonstration Project, Project 4.

Project Objectives:

- Develop a tool to facilitate the selection of neighborhoods to target for residential retrofit programs based on success factors and need.
- Create alternative marketing approaches and materials to generate demand for retrofits.
- Test the marketing approaches and materials using focus groups.
- Create a refined set of marketing materials and marketing plan to be finalized and tested in the Demonstration Project, Project 4.
- Develop an outreach program and presentations to be made to utilities, agencies such as the California Public Utilities Commission (CPUC), and additional communities to recruit them for future neighborhood-based retrofit programs.

Task List

The project’s work scope involves the following technical tasks:

Project & Task #s	CPR	Project & Task Names
Project 1		Market Research & Outreach Project
Task 1.1		Develop Subdivision Screening Tool
Task 1.2		Draft Marketing Plan
Task 1.3		Develop Draft Marketing Materials
Task 1.4		Test Preliminary Marketing Materials
Task 1.5		Refine Draft Marketing Materials & Plan
Task 1.6	X	Analyze Results of Demonstration Project & Refine Marketing Approach
Task 1.7		Develop and Present Outreach Presentation

Task 1.1 Develop Subdivision Screening Tool

The goal of this task is to develop a tool that screens subdivisions for potential inclusion in a targeted retrofit program and identifies those subdivisions that are most likely to realize high penetration rates and large reductions in demand and energy.

The Contractor shall:

- Identify and research subdivisions in the targeted communities built between the late 1970's and the late 1990's.
- Contact key stakeholders via e-mail, phone or meetings in each jurisdiction such as city staff members, utility companies, public agencies, and others for input into the selection process utilizing variables to include but not be limited to:
 - Similarity of house design
 - Age
 - Substation capacity constraints
 - Stability of neighborhood
 - High percentage of home ownership
- Investigate the use of Geographical Information System (GIS) information to pre-select subdivision in the first phase of the screening process.
- Develop a subdivision selection methodology and/or spreadsheet tool report.

Deliverables:

- Final Selection Methodology Report (No Draft)

Task 1.2 Draft Marketing Plan

The goal of this task is to research a residential retrofit marketing plan for communities to be targeted in the Demonstration Project, Project 4.

The Contractor shall:

- Search for and identify key influencers in the community such as homeowner association presidents, service club members, and others to ascertain the most cost effective marketing methods and advertising opportunities.
- Conduct a review of other retrofit services and programs offered in the targeted areas to ensure that efforts are not duplicated with other retrofit programs.
- Assess how other retrofit programs around the country are marketing themselves through:
 - Internet research
 - Talking with program administrators and city/county staff.
- Create an overarching brand and common theme that connects the two sub-plans listed below:
 - Research and design a sub-plan to target subdivision retrofits where scale can be achieved
 - Research and design a sub-plan to target custom or individual homes that need customized, non-scalable retrofits
 - Each sub-plan will include methods for lead generation for each sector such as the development of alliances and sales support.
- Other tools to be researched shall include, but not be limited to:
 - A simple website
 - Direct mail to targeted residences
 - Advertising
 - Local workshops
 - Events

- Prepare Draft Marketing Plan

Deliverable:

- Draft Marketing Plan

Task 1.3 Develop Draft Marketing Materials

The goal of this task is to create a collection of preliminary marketing materials consistent with the marketing plan drafted in Task 1.2 for use in testing various marketing and messaging approaches with small groups of citizens from target communities.

The Contractor shall:

- Develop four or more variations of visual and written messaging campaigns:
 - At least two variations will be created for the target subdivision home sector
 - At least two variations will be created for the target custom home sector
- Utilizing the messaging campaigns listed above, create marketing campaigns to include but not be limited to, items such as:
 - Billboard ads
 - Web ads
 - Print ads
 - Brochures
- Develop sales training curriculum utilizing the marketing materials for the four or more messaging campaigns.

Deliverable:

- Four sets of Draft Marketing Campaign Proofs
- Sales Training Curriculum

Task 1.4 Test Preliminary Draft Marketing Materials

The goal of this task is to use meetings, surveys and/or focus groups to review alternative marketing approaches and to get input on how to best communicate the benefits of a residential retrofit program.

The Contractor shall:

- Work with subcontractor to conduct four or more meetings, surveys and/or focus groups including:
 - At least two for the target subdivision home sector
 - At least two for the target custom home sector
- Identify and select participants from targeted communities with representative demographics utilizing various methods such as:
 - Homeowner Association officers/members
 - Community Service Officers
 - Various ads
 - Surveys/Questionnaires

- Show each participant the preliminary marketing materials developed in Task 1.3 applicable to their sector.
- Obtain and document reactions.
- Probe perceived benefits, concerns and obstacles to doing residential retrofits.
- Prepare Marketing Review Group Input Report

Deliverable:

- Marketing Review Group Input Report (No Draft)

Task 1.5 Refine Draft Marketing Materials and Plan

The goal of this task is to use the feedback from the meetings, surveys and/or focus groups conducted in Task 1.4 to refine the draft marketing materials, plan, and fully develop the marketing tools required for initial campaigns.

The Contractor shall:

- Refine the draft marketing materials based upon the feedback received in Task 1.4, and prepare the final marketing materials tools for demonstration project.
- Revise the draft marketing plan based upon the feedback received in Task 1.4, and prepare the final marketing plan for demonstration project.
- From the research, design:
 - Final website
 - Final brochures
 - Final public relations plan for both the target custom home and target subdivision home sectors
- Develop a list of potential vendors to help implement the campaign including, but not limited to:
 - Web designers
 - Printers
 - Public Relations Firms.
- Obtain bids from at least three (3) vendors
- Finalize vendor selection with input and approval from the Energy Commission Contract Manager.

Deliverables:

- Marketing Materials and Tools for Demonstration Project
- Marketing Plan for Demonstration Project
- Vendor Selection

Task 1.6 Analyze Results of Demonstration Project and Refine Marketing Approach

The goal of this task is to analyze the results of the demonstration project (Project 4). This includes assessments of the motivations of homeowners for undertaking residential retrofits, the importance of non-energy benefits in homeowners' decisions, the impact of non-energy benefits on the cost/benefit analysis performed by homeowners, and

assessments of the effectiveness of AB 811 financing, utility incentive and federal tax incentives.

The Contractor shall:

- Design surveys to gauge homeowner satisfaction, including, but not limited to:
 - Indoor air quality, comfort, and health benefits such as reduction of allergies and asthma attacks
 - Peace of mind regarding the maintenance and condition of the house
 - Perceived value and status in the neighborhood as a consequence of participating in the retrofit program
 - Changes in behavior, such as more awareness about energy cost and efficiency due to the demonstration project
 - Energy cost savings and other benefits (e.g., reduction in maintenance/operation costs)
 - Effectiveness of AB 811 financing, utility incentive and federal tax incentives.
- Conduct above surveys after retrofits are completed.
- Based upon the survey results, refine the following items, at a minimum, to achieve a higher penetration rate in subsequent marketing campaigns:
 - Marketing tactics
 - Messaging
 - Materials
- Prepare a Survey Results Report to include, but not be limited to:
 - Information on homeowner satisfaction (as identified previously in the Contractor shall portion of this task)
 - Motivations for undertaking residential retrofits
 - Importance of energy and non energy benefits in homeowners' decisions
 - Impact of non energy benefits on the cost/benefit analysis performed by homeowners
 - Assessment of effectiveness of AB 811 financing, utility incentive and federal tax incentives
 - Update marketing materials and messaging campaigns based upon feedback
- Participate in CPR as per Task A.2.

Deliverables:

- Survey instrument (no draft)
- Survey Results Report
- Refined Marketing Materials (no draft)
- CPR Report

Task 1.7 Develop and Present Outreach Presentation

The goal of this task is to build upon the lessons learned from the Demonstration Project, Project 4, and recruit additional communities to implement Large Scale Residential Retrofit Programs.

The Contractor shall:

- Create a PowerPoint presentation outlining the Large Scale Residential Retrofit program demonstration project findings for initial target subdivision homes.
- Give first presentation and/or webinar after the implementation of the initial target subdivision homes.
- Update the presentation as additional target subdivision homes are completed.
- Offer to present at conferences, if contractor is invited and give subsequent presentations to no less than five (5) of the following:
 - Local government (City Council, board of supervisors, planning and building departments)
 - Tradeshows
 - Conferences such as Affordable Comfort, American Council for an Energy-Efficient Economy (ACEEE)
 - State Agencies and utilities (e.g., CPUC, Energy Commission, Housing and Community Development, investor and publicly owned utilities)
- When demonstration project is completed, create a PowerPoint presentation for future outreach describing the full demonstration project and its results.

Deliverables:

- Initial Demonstration Project Findings PowerPoint Presentation
- Demonstration Project Results Outreach PowerPoint Presentation

Project 2 Residential Retrofit Demonstration Project Design

The goal of the project is to summarize, define and recommend resolutions to the legal, financial, security, and business issues that face a municipality and a retrofit delivery organization when implementing large-scale integrated residential retrofits and then to design the plan for Project 4, Demonstration Project, so it achieves scale.

Project Objectives:

- Design a sales infrastructure and organization to implement and manage a large-scale residential retrofit program.
- Develop and/or customize a tracking system focused on the administration of the program.
- Summarize the legal questions surrounding the implementation of AB 811, Property Assessed Clean Energy (PACE) and the scaling of residential retrofit finance programs.
- Summarize financial options available to municipalities for financing PACE based programs.
- Describe and summarize a process for contractor selection for each of the host municipalities.

Task List

The project's work scope involves the following technical tasks:

Project & Task #s	CPR	Project & Task Names
Project 2		Residential Retrofit Demonstration Project Design
Task 2.1		Develop Sales Infrastructure
Task 2.2		Develop Tracking System
Task 2.3		Summarize Legal Issues and Resolutions
Task 2.4		Summarize Financial Options
Task 2.5		Contractor Selection Process
Task 2.6		Develop Preliminary Retrofit Procedures and Packages

Task 2.1 Develop Sales Infrastructure

The goal of this task is to design a sales infrastructure and organization to coordinate, implement and manage a large-scale residential retrofit program.

The Contractor shall:

- Develop and prepare a Sales Infrastructure Report that addresses all of the following items to include but not be limited to:
 - Identify and specify the roles of the:
 - Host municipality
 - Administrator
 - Auditors
 - Sales personnel
 - Contractors
 - Installers
 - Utilities
 - Create sales procedures that guide the sales process from inquiry to contract signing to implementation based upon:
 - Marketing materials developed in Task 1
 - Marketing plan developed in Task 1
 - Campaigns developed in Task 1
 - Research sales infrastructure possibilities such as:
 - Contract sales people
 - In-house sales people
 - Auditors as sales people
 - Contractors as sales people
 - Determine the necessity of a call center to handle:
 - In-take calls for interested homeowners
 - Homeowner questions/concerns
 - Possible feedback loop for homeowners and municipalities
- Design the logistics of the program implementation plan and integrate them with Task 2.2, Develop Tracking System.
- Identify number of homes (with a goal of at least 500) that will participate in the retrofit program

- Develop procedures to procure materials and equipment for the retrofits (no PIER funds will be used to actually procure these items), such as:
 - Building materials
 - Mechanical equipment
 - Solar panels

Deliverable:

- Sales Infrastructure Report

Task 2.2 Develop Tracking System

The goal of this task is to develop a tracking system focused on the administration of the program.

The Contractor shall:

- Develop or customize a tracking system to include but not be limited to:
 - Customer Data (including baseline monthly, annual electricity and natural gas consumption for the preceding 12 month period)
 - Sales and Contracting issues and questions
 - Audit information:
 - Test-in and test-out data (pre-retrofit and post-retrofit)
 - Modeling data
 - Retrofit package chosen by homeowner
 - Logistics for the retrofit:
 - Contractor
 - Date for test-in
 - Dates for installation
 - Date for test-out
 - Ability to handle a large volume of leads and individual retrofit projects
 - Data for Build It Green's Climate Calculator.
- Forward Climate Calculator data to Build It Green to enable municipalities to keep track of their GHG emissions reductions generated through the program and help them meet their AB 32 reporting requirements.
- Determine and compare pre and post monthly electricity and natural gas consumptions, peak electric load reductions and cost. Compare energy and cost savings and reasons for anomalies.
- Develop input and output pages from tracking system containing all the information identified in the "Contractor shall" portion of this task.

Deliverable:

- Input and Output Pages from Tracking System (no draft)

Task 2.3 Summarize Legal Issues and Resolutions

The goal of this task is to describe and summarize legal questions surrounding the implementation of AB 811/PACE and the scaling of residential retrofits.

The Contractor shall:

- Prepare a Legal Issues and Institutional Barriers Report, to include but not be limited to the following:
 - Review and summarize legal barriers and questions encountered by Renewable Funding for the California First program, regarding the implementation of an AB 811 program and their potential resolution.
 - Summarize legal barriers and questions surrounding the implementation of an AB 811 program and their potential resolution, including, but not limited to:
 - Which AB 811 program should a municipality join?
 - Should a municipality create its own program?
 - Discussion of how an AB 811 program can be expanded to finance retrofits for a large number (e.g., 500 or more) of homeowners (Task 4.1.4).
 - How does the financing work when it encompasses a large number of homeowners and who is financially liable?
 - How does the financing structure differ when funding individual versus a large number of homeowners?
 - Discussion of how liability for installation problems might affect municipalities.
 - Are municipalities liable for installation errors?
 - If so, how are those handled?

Deliverable:

- Legal Issues and Institutional Barriers Report

Task 2.4 Summarize Financial Options

The goal of this task is to describe and summarize which of the financial options associated with AB 811 best suits the Demonstration Project, Project 4.

The Contractor shall:

- Prepare a Financial Options Report to include but not be limited to the following:
 - Description and review of financing options available to municipalities, benefits and disadvantages of each option including:
 - Use of municipal treasury funds
 - Issuance of bonds
 - Bridge loans
 - Use of stimulus block grant funds or other government funds (specify)
- Description of and review of the California First PACE Program being developed by Renewable Funding and adopted by over 150 agencies in California.

Deliverable:

- Financing Options Report

Task 2.5 Contractor Selection Process

The goal of this project is to describe and summarize criteria and a process to select contractors in addition to Green Home Solutions by Grupe to install energy efficiency

retrofits in residential homes. The Contractor can use this developed process instead of the process for adding subcontractors in the terms and conditions of this Agreement because the terms and conditions do not apply to this situation; the additional selected contractors will not receive PIER funds.

The Contractor shall:

- Prepare a Contractor Criteria and Selection Process document to include but not be limited to the following:
 - List of selection criteria to compare contractor's experience in the following areas:
 - Experience in the retrofit/remodel arena, especially with residential homes
 - Building science credentials, especially with energy efficiency
 - Willingness and ability to obtain Building Performance Institute (BPI) certification
 - Ability to achieve economies of scale
 - Willingness to pass cost savings through to consumers
 - Building permitting
 - Quality construction
 - Description of an appropriate selection process for municipalities, including suggested weighting factors for the selection criteria and available resources to assist

Deliverable:

- Contractor Criteria and Selection Process Document

Task 2.6 Develop Preliminary Retrofit Procedures and Packages

The goal of this task is to establish preliminary audit and test procedures, and to develop at least two optimal retrofit packages for each set of characteristic floor plans from targeted subdivision homes selected in Project 1.

The Contractor shall:

- Review California Home Energy Rating System (HERS) Phase II, Home Performance with Energy Star, GreenPoint Rated for Existing Homes and other retrofit programs to develop a comprehensive low cost method for conducting rapid home audits and testing methods.
- Based upon review above, develop retrofit procedures to include “test in/test out” methods.
- Develop or customize audit checklist.
- Test these methods developed on characteristic houses in selected targeted subdivision homes.
- Develop preliminary audit and test procedures.
- Utilize simulation tools to evaluate a variety of energy efficiency measures.
- Use sequential analysis methods to select optimal package of retrofit measures for each characteristic plan.

- Construct packages for at least two levels of energy savings retrofits for each characteristic plan to provide varying levels of cash flow (energy savings less amortized cost).
- Prepare Preliminary Audit Procedures and Retrofit Packages Report to include but not be limited to, all of the areas discussed in the Contractor shall section of this task, a description of the initial packages and the cash flow analysis for each.

Deliverable:

- Preliminary Audit Procedures and Retrofit Packages Report

Project 3 Curriculum Development and Training

The goal of Project 3, Curriculum Development & Training, is to identify and/or develop curriculum needed for contractors involved in retrofits as well as the training needed for the installers of the specific retrofit packages designed in Task 2.6 of Project 2.

Project Objectives:

- Describe and summarize existing CBPCA contractor training curriculum particularly for volume retrofits.
- Develop retrofit measure installation curriculum modules.
- Train contractors and installers using the measure installation modules developed in Task 3.3.

Task List

The project’s work scope involves the following technical tasks:

Project & Task #s	CPR	Project & Task Names
Project 3		Curriculum Development and Training
Task 3.1		Summarize Contractor Training Curriculum
Task 3.2		Co-sponsor Training for Contractors
Task 3.3	X	Develop Retrofit Installation Curriculum
Task 3.4		Conduct Training for Contractors and Installers on Specific Retrofit Packages

Task 3.1 Summarize Contractor Training Curriculum

The goal of this task is to summarize existing CBPCA training curriculum particularly for volume retrofits.

The Contractor shall:

- Describe and review existing components of Building Performance Institute (BPI), Home Performance with Energy Star, and California HERS Phase II training modules and summarize, particularly for volume retrofits utilizing:
 - Curriculum Reviews
 - Curriculum development methods
 - Input from stakeholders (e.g., local governments, California Energy Commission (Energy Commission), utilities, etc.)

- Collaborate with CBPCA, Pacific Gas & Electric Company (PG&E) and BPI to ensure the training modules meet the BPI certification requirements through:
 - Meetings
 - E-mails
 - Conference calls
- Prepare a Summary of Training Curricula to include but not be limited to, all of the items discussed in the Contractor shall section of this task.

Deliverable:

- Summary of Contractor Training Curricula

Task 3.2 Co-Sponsor Training for Contractors

The goal of this task is to Co-Sponsor training of the contractors selected through the process developed in Task 2.5 utilizing the curricula identified in Task 3.1.

The Contractor shall:

- Co-Sponsor training identified in Task 3.1 for contractors.
- Co-Sponsor training for contractors leading to the contractors' BPI certifications.
- Prepare Training Report to include but not be limited to, all the items discussed above.

Deliverables:

- List of Contractors Attending Training (No Draft)
- Training Report

Task 3.3 Develop Retrofit Installation Curriculum

The goal of this task is to develop training modules for the installation of retrofit packages developed under Project 2 for specific targeted subdivision homes.

The Contractor shall:

- Develop training modules for the installation of the retrofit measures developed in Project 2 for the selected targeted subdivision homes utilizing:
 - The developed retrofit packages (Task 2.6)
 - Proper building science installation techniques for each measure
 - Adherence to local building codes
- Test these modules in a pilot class to contractors and installers.
- Refine the training modules based on results of the pilot class.
- Prepare the Installation Training Curriculum outline to include but not be limited to, all the items discussed in the Contractor shall section of this task.
- Participate in CPR as per Task A.2.

Deliverables:

- Installation Training Curriculum Outline
- CPR Report

Task 3.4 Conduct Training for Contractors and Installers on Specific Retrofit Packages

The goal of this task is to conduct training of contractors and installers utilizing the curriculum developed in Task 3.3.

The Contractor shall:

- Offer the training in and around the pilot program municipalities.
- Conduct training for contractors and installers participating in the pilot program.
- Prepare Training Report, to include but not be limited to the training curriculum developed in Task 3.3.
- Prepare a list of contractors and installers participating in the training.

Deliverable:

- Training Report
- List of Attendees (No Draft)

Project 4 Large Scale Residential Retrofit Demonstration Project

The goal of Project 4 is to demonstrate that residential energy and PV retrofits can be accomplished on a large-scale basis with a minimum of 20 percent market penetration in targeted communities (20% of all the total homes in the community).

Project Objectives:

- Refine Retrofit Package Design (Task 2.6).
- Develop Installation and Quality Assurance/Quality Control (QA/QC) Procedures.
- Implement the marketing plan developed in Project 1.
- Choose two or more houses with Energy Commission Contract Manager approval, for deep retrofit, reducing energy consumption 70% or more.
- Conduct the monitoring of these houses to verify projected energy savings.

Task List

The project's work scope involves the following technical tasks:

Project & Task #s	CPR	Project & Task Names
Project 4		Large Scale Residential Retrofit Demonstration Project
Task 4.1		Large Scale Residential Retrofit Demonstration
Task 4.1.1		Refine Retrofit Package Design
Task 4.1.2		Develop Installation and QA/QC Procedures
Task 4.1.3		Marketing and Sales
Task 4.1.4		Implement and Manage Retrofit
Task 4.1.5		Complete Monitoring & Verification
Task 4.1.6		Prepare Demonstration Project Report
Task 4.2		Deep Retrofit Demonstration
Task 4.3		Analyze and Disseminate Results

Task 4.1 Large Scale Residential Retrofit Demonstration

Task 4.1.1 Refine Retrofit Package Design

The goal of this task is to build on the initial audit procedures and measure packaging methods developed in Task 2.6 of Project 2, Demonstration Project Design, and create retrofit package designs for additional selected subdivisions in Stockton, Pleasanton and Dublin.

The Contractor shall:

- Refine the preliminary retrofit packages extrapolating what is learned from:
 - A sample audit
 - Plan review of standard plans from a selected subdivision
 - Energy modeling of the plans
- Work with selected contractors to estimate cost for each energy saving measure in the retrofit package.
- Update cost data based on actual experience, possibly resulting in modifications to the packages as the project proceeds.
- Prepare Retrofit Package Report to include but not be limited to, all the items discussed in the Contractor shall section of this task
 - Identification of selected targeted subdivision homes
 - Retrofit package designs
 - Energy modeling
 - Estimated cost and energy savings
 - Energy cost savings
 - Plan and schedule for moving forward.

Deliverables:

- Retrofit Package Report

Task 4.1.2 Develop Installation and QA/QC Procedures

The goal of this task is to develop installation and QA/QC procedures in conjunction with the curriculum and training developed in Project 3 for each selected subdivision.

The Contractor shall:

- Identify a house from a targeted community selected in Project 1, Market Research and Outreach, that will serve as a trial installation of the retrofit measures.
- At the selected house:
 - Install the selected retrofit package
 - Test and improve retrofit installation procedures and QC measures.
 - Determine and monitor energy savings and peak electric load reductions for each package or measure
- Document the installation and QA/QC procedures and prepare a QA/QC manual to include but not be limited to:
 - Installation/retrofit checklists

- Retrofit package specifications
- Testing and commissioning to verify operability within design specifications.
- Provide this manual for contractor training and QA/QC inspections.
- Prepare Retrofit Installation Manual to include but not be limited to step by step instructions for retrofit installations for each selected subdivision.
- Prepare QA/QC Manual for each selected subdivision.

Deliverables:

- Retrofit Installation Manual
- QA/QC Manual

Task 4.1.3 Marketing and Sales

The goal of this task is to implement the marketing plans developed in Project 1 and develop the sales force needed to achieve high acceptance of the retrofit packages offered.

The Contractor shall:

- Organize a retrofit outreach force using in-house and/or contract sales personnel, auditors and/or contractors.
- Organize a telephone and web inquiry response capability using in-house and/or contract personnel.
- Print and disseminate materials developed in Project 1, Market Research and Outreach, through pathways including, but not limited to:
 - Mailers
 - Home Owner Association meeting presentations
 - Website
- Submit all planned marketing and sales material using the Energy Commission's name, logo, or any other identifying information or making any reference to State sponsorship of the work, along with a description of how it will be used, to the Commission Contract Manager. The Contractor must receive written approval from the Commission Contract Manager before using it. Instead of the timeframes listed in Task A.5, the Commission Contract Manager will have a reasonable amount of time to review and approve/disapprove this material. A longer time period than listed in Task A.5 may be needed in order for the Commission Contract Manager to consult with other Energy Commission personnel (e.g., personnel in the media office or the legal office).
- Work all leads through their sales staff in coordination with Subcontractors, and selected contractors utilizing the sales infrastructure developed in Project 2.
- Obtain feedback from builders and selected contractors to ensure their input into program design.
- Respond to inquiries.
- Disseminate information on residential energy retrofits and available financing.
- Close contracts with homeowners. The contracts shall contain a provision indicating:

“[insert contractor’s name performing retrofits], and their agents, employees, and subcontractors are acting in an independent capacity and not as officers, employees, or agents of the California Energy Commission or the State of California. The California Energy Commission and the State make no warranty, express or implied, and assume no liability regarding any of the work performed by them or regarding any materials, supplies, equipment, or any other item provided by them.

[Insert name of homeowner(s) signing contract] agrees to hold harmless the Energy Commission, the State, their officers, agents and employees from any and all claims and losses accruing or resulting from the work services, materials, supplies, equipment, or any other item or service provided by [insert name of contractor] and their agents, employees, and subcontractors in connection with the performance of this contract, and from any and all claims and losses accruing or resulting to any person, firm or corporation who may be injured or damaged by them in the performance of this contract.”

- Schedule audits and installations using in-house and/or contract personnel, auditors and/or contractors.
- Provide a list showing commitments from 500 or more homeowners to complete retrofits, including location, and retrofit options selected.

Deliverable:

- Planned marketing and sales material referencing the Energy Commission or the State of California (no draft)
- List of Commitments (no draft)

Task 4.1.4 Implement and Manage Retrofit

The goal of this task is to coordinate the retrofit process for homes that commit to the Demonstration Project.

The Contractor shall:

- Ask homeowners to complete a pre-audit survey on occupancy energy usage behavior.
- Enter the home into the tracking system and assign a contractor to complete the preliminary audit for “test-in.”
- Ask the homeowner to choose one retrofit package for installation based upon the information gathered from the survey and the audit.
- Complete the retrofit installation and perform a “test-out” audit using the checklist developed in Task 2.6.
- Collect and enter relevant data into the tracking system developed in Task 2.2 to track retrofit progress, facilitate reporting, and allow for customer follow-up.
- Work with Subcontractors and/or other suppliers to minimize equipment procurement and installation costs through quantity discounts and other means, and by resolving installation problems that increase labor time.
- Work with utilities regarding rebates for retrofit packages.

- Work with the project team to review HERS testing results and conduct spot-checks to assure that quality criteria are being met.
- Utilize pre-audit surveys to train homeowners on their upgrades and on ways to help save energy through their own behavior.
- Share the data from the audit or “test-in” and the retrofit package chosen with Build It Green for use in their Climate Calculator to track GHG reductions.
- Prepare Retrofit Activities Report, to include but not be limited to a discussion of the results of all of the items listed in the Contractor shall section of this task

Deliverables:

- Retrofit Activities Report

Task 4.1.5 Complete Monitoring and Verification

The goal of this task is to conduct long-term monitoring of two or more houses to verify projected energy savings.

The Contractor shall:

- Select two or more retrofit houses for monitoring.
- Install monitoring sensors, time of use data loggers and collect data including but not limited to temperature and energy use (kWh, kW and therms) and production (if applicable).
- Compare measured data from one year of monitoring to simulation results used in the development of the retrofit packages. Data to be analyzed to include but not be limited to:
 - Whole house electric (kWh and kW) and gas use
 - Heating ventilation and air conditioning (HVAC) system energy use
 - Indoor and outdoor temperatures
- Make adjustments to simulations as appropriate to fine tune energy savings estimates.
- Prepare Monitoring and Model Calibration Report, to include but not limited
 - Discussion of the results of all the items listed in the Contractor shall section of this task
 - Resulting electric energy demand and natural gas usage before and after the retrofit
 - How this monitored data will be used in forecasting results for retrofitted homes that will not receive complete monitoring and verification.

Deliverable:

- Monitoring and Model Calibration Report

Task 4.1.6 Prepare Demonstration Project Report

The goal of this task is to summarize the results of all subtasks in a project report.

The Contractor shall:

- Prepare at least one paper for presentation at an industry conference such as the ACEEE Summer Study.
- Write an article for Home Energy magazine, or equivalent.
- Pursue opportunities to disseminate project results to other venues as well as municipalities, utilities, government staff at the CPUC, Energy Commission, and other groups.
- Prepare a PowerPoint presentation of subtask results.
- Present results to a minimum of four groups to include but not be limited to, utilities, City staff, architects, etc.
- Prepare Demonstration Project Report to include but be not limited to, discussion of how and where the project results will be disseminated.

Deliverable:

- Journal Articles (no draft)
- Conference Paper (no draft)
- PowerPoint Presentation (no draft)
- Demonstration Project Report

Task 4.2 Deep Retrofit Demonstration

The goal of this task is to choose two (2) or more houses for deep retrofit, reducing energy consumption by 70% or more, and to coordinate same with the Thousand Home Challenge (Challenge). The Challenge sets the ambitious goal of using deep energy retrofits to reduce actual energy use in one thousand homes across North America by 70-90%. There are two separate strands of the Challenge, one for those who have not yet taken on efficiency and will be able to cut their usage dramatically within the time-frame of the Challenge, and another for those who have been steadily reducing their usage over a period of years and energy reductions of 70% will not be plausible.

The Contractor shall:

- Identify two (2) or more houses with Energy Commission Contract Manager approval, for deep retrofits based on the criteria for the Challenge, .
- Audit and “test in” the houses (test in the home prior to beginning of work).
- Monitor energy use in each house for at least four months prior to the retrofit, using energy bill data and monitoring sensors on HVAC equipment to collect energy usage data.
- Simulate the starting energy performance of the houses and their performance with various energy efficiency retrofit measures.
- Design retrofits to be consistent with the Challenge requirements.
- Oversee installation of selected retrofit measures, along with monitoring sensors and equipment, to collect data to include, but be not limited to, indoor and outdoor temperature and energy use (kWh, kW and therms).
- “Test-out” the houses on the completion of the retrofit work (test the home after the completion of work).
- Monitor performance of each house for six months or more and collect data to include but not be limited to:

- Whole house electric and gas use (including peak demand)
- HVAC system energy use
- Indoor and outdoor temperatures
- Analyze the data collected for each house and compare energy use for the HVAC system and the whole house before and after the retrofit.
- Analyze actual results as compared to projected results.
- Prepare Deep Retrofit Performance Report to include but not be limited to:
 - Discussion of the results of all of the items listed in the Contractor shall section of this task
 - Amount of energy consumption and demand reduced relative to baseline consumption.
 - Include all assumptions and relevant data associated with gas, electricity, demand, temperature and other factors.

Deliverables:

- Deep Retrofit Performance Report

Task 4.3 Analyze and Disseminate Results

The goal of this task is to analyze the results of the retrofits using energy utility bill data for 100 or more of the retrofit homes that participated in the Demonstration Project to determine if the homes are meeting the targeted results for energy savings.

The Contractor shall:

- Gain written permission of the homeowners to collect energy utility bill data from homes to be analyzed.
- Work with PG&E to get “before and after” utility bill data.
- Develop a spreadsheet for use in analyzing the data and populate the spreadsheet.
- Analyze the data and results.
- Prepare a report and PowerPoint presentation highlighting the Demonstration Project results and make the report available to the CPUC, municipalities, utilities, and others.
- Present the findings to at least four additional municipalities and encourage them to participate in programs similar to the LSRRP.
- Prepare Demonstration Project Results Report to include but not be limited to:
 - Discussion of the results of the retrofits for at least 100 homes that participated in the LSRRP
 - Pre and post-retrofit energy use and resulting savings
 - Estimates of cumulative energy impacts for the 100 homes (kWh/yr, kW therms/year)
 - Reasons why homes met or did not meet targeted energy savings
 - Lessons learned and suggestions for LSRRP improvement. Report should include all assumptions used to forecast and annualize the savings and copies of spreadsheets, as appropriate.

Deliverables:

- Demonstration Project Results Report
- Demonstration Project Results PowerPoint Presentation

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