

EPIC TRIENNIAL INVESTMENT PLAN 2015-17**Proposed Energy Research Initiative
Questionnaire**

Title of Proposed Initiative (Short and concise): Assessing and Addressing Obstacles to Paid-from-Savings Efficiency in the Non-Federal Public Sector in California

Investment Areas (Check one or more) – *For definitions, see First Triennial Investment Plan, page 12:*

- Applied Research and Development
 Technology Demonstration and Deployment
 Market Facilitation

Electricity System Value Chain (Check only one): See CPUC Decision 12-05-037, Ordering Paragraph 12.a. http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/167664.PDF.

- Grid operations/market design
 Generation
 Transmission
 Distribution
 Demand-side management

California Energy Commission

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Issues and Barriers:

California state and local governments, universities and school systems are impelled to reduce energy use in their facilities by AB32 GHG reduction mandates, the CA Green Building Initiative, their own sustainability goals and need to reduce costs, and other external and internal drivers. Yet tax resources are scarce for even their primary public missions, let alone improving efficiency of operations. Public entities are compelled to rely on “other peoples’ money” (OPM): energy savings performance contracts (ESPCs) with energy services companies (ESCOs), energy utility DSM programs, utility and state public benefit programs, and power purchase agreements (PPAs) for renewables all offer third-party investments in ECMs that will wholly or substantially pay for themselves. New public initiatives emerge to finance efficiency in local facilities; e.g. Proposition 39 passed in 2012, for which implementation will begin this year.

Yet studies repeatedly document that only a fraction of cost-effective ECMs are captured, and market penetration by the ESCO industry and utility and state incentives in the public sector is a fraction of the potential. Use of paid-from-savings OPM in the public sector necessitates non-conventional procurement and engineering, debt instruments, project oversight and financial reconciliation if savings targets are not met, all of which necessitate allocation of very scarce skilled personnel to unaccustomed tasks and collaboration across multiple agencies of public sector agencies.

There are not only these obstacles to reducing energy costs through third-party financing; but there are also obstacles to achieving the depth of energy savings through retrofits that will be necessary to achieve the GHG goals. The conventional measures that have most frequently been implemented through utility incentives and ESCO financing will not achieve the 50+% savings that are possible with whole-building, integrated-energy-retrofit measures.

There are thus two types of obstacles to overcome: (1) primarily management, procurement and procedural obstacles to conventional energy retrofits through OPM, and (2) technical obstacles of using unconventional retrofit technologies for the deep retrofits that will be necessary for GHG and long-term sustainability goals.

Initiative Description and Purpose:

This project will identify both types of obstacles in CA state and local government facilities, and develop solutions that mitigate them. The Finance Team of LBNL's Sustainable Federal Operations Group has decades of cumulative experience facilitating paid-from-savings energy retrofits in Federal facilities [in the last 15 years, over \$1B in federal projects; ~200M in CA alone], including overcoming obstacles to deploying new and under-utilized technologies in ESPCs, and with the GSA Deep Retrofit ESPC Initiative. LBNL will apply lessons learned from those experiences to assess and address the obstacles in CA local and state government and public universities in California.

Together with collaborators from those sectors, the team will investigate obstacles to conventional and deep retrofits with OPM, develop strategies for overcoming them and conduct demonstration projects to document the efficiency of those strategies.

The team will assess the potential market impact of expanding demand-side technology deployment effort in the state, university and local government sector in CA, by characterizing the efficiency potential inherent in the existing building stock, cataloging potential ECMs in those facilities, and identifying target opportunities with significant potential for replication. In a second stage, focused on deployment, LBNL will work with a set of representative local government and university sites (large, medium, and small) to identify and overcome barriers and implement financed integrated retrofit projects, demonstrating model strategies for accelerating deployment. These strategies will employ various funding mechanisms, ranging from on-bill financing to performance contracting, all of which are expected to take advantage of the plethora of leveraging opportunities from incentives and demand response programs that are widely available in California.

In the "Contractor shall... format, tasks are as follows:

- Contractor shall identify data sources and models to evaluate technical potential for energy efficiency gains in State, university and local government-owned facilities in California. Candidate sources include:
 - ESCO Industry Trends report, LBNL, Stuart, Larsen, Goldman and Gilligan; model for projecting remaining market potential for ESPC retrofits by building ownership sector
 - California Statewide Property Inventory
 - California Database for Energy Efficiency Resources (DEER)
 - California Energy Consumption Data Management System
 - California DGS Buildings Inventory
- Contractor shall summarize technical potential for efficiency gains in State, university and local government-owned facilities in California, utilizing:
 - Energy-use modeling with CBECS profiles, and calibrating with benchmarking and audit data from known investment-grade audits and CA parameters of ECMs from the DEERS database
 - Input from expert panels on State, university and local government energy retrofits in CA [See Key Partners and Collaborators below]
 - Interviews and focus group discussions with State, university and local government facilities managers to corroborate and further calibrate projections
- Contractor shall assess and summarize market barriers to uptake in the CA State, university and local government sector of state and utility incentives and use of third-party financing, by
 - Summarizing market barriers encountered and addressed by SFOG Finance Team in 15 years of facilitating Federal paid-from-savings energy retrofits
 - Matching known barriers from Federal experience with contractual, management and financing practices and parameters in CA State, university and local governments
 - Searching for evaluation studies, and conducting interviews with principals of State of California Energy Partnership Program (technical assistance to local governments) and Green California third-party retrofits of state buildings
 - Convening focus groups of all elements of the non-federal public sector in CA, the energy services industry (ESCOs, Resource Energy Managers (REMs), utilities and public and not-for-profit technical assistance providers
- Contractor shall identify target opportunities at state, university and local government sites with significant potential for replication throughout the State, university and local government facilities inventory

- Contractor shall coordinate initiation and facilitate implementation of at least three (3) demonstrations of integrated demand-side energy-use reduction projects utilizing utility incentives and/or paid from savings financing at California university or local government sites [LBNL has assisted 14 utility-financed retrofit projects, at an aggregate value of \$80M in Federal facilities in California in the last 5 years, and 11 ESPC projects over the same time period at an aggregate value of ~\$115M with guaranteed savings of \$216M]
 - Assessing implementation barriers, strategies to overcome, comprehensiveness of approach and success of technology integration
- Contractor shall publish case studies of these current demonstration projects and seek past case studies of holistic integrated energy-use reduction in CA State, university and local government facilities
- Contractor shall design and suggest methods for implementation of outreach and marketing plans for utility incentive and financing to State, university and local government facilities, through:
 - Collaboration with utility DSM, California DGS and California ESCO principals
 - Lessons-learned from case studies
 - Interviews and focus-group discussions with CA State, university and local government facilities managers, sustainability officers and program staff
- Contractor shall assess and evaluate the technical assistance and project implementation support required for the technical potential of utility and state DSM programs and paid-from-savings energy retrofits to be fully realized in CA State, university and local government facilities in CA. Where program features conflict with CA state or local government procurement rules or management practices, contractor will work with agency, utility and PUC personnel to seek solutions.
- Contractor shall assess and evaluate potential funding mechanisms for the technical assistance and project implementation support requirements of CA State, university and local government facilities to be realized.
- Contractor shall prepare a Final Report on Assessing and Addressing Obstacles to Paid-from-savings Energy retrofits in the State, university and local government sectors in California

Stakeholders:

Identify the stakeholders who support the initiative.

Background and the State-of-the-Art:

- What research development and demonstration has been done or is currently being done to advance this technology or strategy (cite past research as applicable)?
 - Performance Contracting and Energy Efficiency in the State Government Market (LBNL 2008)
 - [Stuart, Elizabeth, Peter H. Larsen, Charles A. Goldman, and Donald Gilligan. *Current Size and Remaining Market Potential of the U.S. Energy Service Company Industry*. LBNL, 2013.](#)
 - [Larsen, Peter H., Charles A. Goldman, and Andrew Satchwell. *Evolution of the U.S. Energy Service Company Industry: Market Size and Project Performance from 1990-2008*., 2012.](#)
 - [Larsen, Peter H., Charles A. Goldman, Donald Gilligan, and Terry E. Singer. "Incorporating Non-energy Benefits into Energy Savings Performance Contracts." In *2012 ACEEE Summer Study on Energy Efficiency in Buildings*. Asilomar Conference Center, Pacific Grove, California: ACEEE, 2012.](#)
 - [Borgeson, Merrian, Mark Zimring, and Charles A. Goldman. *The Limits of Financing for Energy Efficiency*., 2012.](#)
 - [Larsen, Peter H., Charles A. Goldman, and Andrew Satchwell. *Evolution of the U.S. Energy Service Company Industry: Market Size and Project Performance from 1990-2008*., 2012.](#)
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- Describe any public and/or private successes and failures the technology or strategy has encountered in its path through the energy innovation pipeline: lab-scale testing, pilot-scale testing, pre-commercial demonstration, commercial scale deployment, market research, workforce development.
- Identify other related programs and initiatives that deal with the proposed technology or strategy, such as state and federal programs or funding initiatives (DOE, ARPA-E, etc.).

**Justification:**

Describe how this technology or strategy will provide California IOU electric ratepayer benefits and provide any estimates of quantified annual savings/benefits in California, including:

- Name of sector and estimated size and energy use.
- Quantifiable performance improvements for the proposed technology/strategy.
- Maximum market potential, if successful.
- Number of direct jobs created in California.
- Why this research is appropriate for public funding.

Ratepayer Benefits (Check one or more):

- Promote greater reliability
- X Potential energy and cost savings
- Increased safety
- X Societal benefits
- Environmental benefits - specify
- GHG emissions mitigation/adaptation in the electricity sector at the lowest possible cost
- Low emission vehicles/transportation
- Waste reduction
- X Economic development

Describe specific benefits (qualitative and quantitative) of the proposed initiative

Public Utilities Code Sections 740.1 and 8360:

Please describe how this technology or strategy addresses the principles articulated in California Public Utilities Code Sections 740.1 and 8360. The California Public Utilities Code is available online at www.leginfo.ca.gov/cgi-bin/calawquery?codesection=puc.