STATE OF CALIFORNIA
EPIC TRIENNIAL INVESTMENT PLAN 2015-17
Proposed Energy Research Initiative
Questionnaire

CALIFORNIA ENERGY COMMISSION

(This is a Request for Information only - Complete Pages 1 and 2 for each initiative)

Title of Proposed Initiative (Short and concise): **Implementation of a management system for continual improvement of energy performance: targeting facilities with limited exposure to energy management concepts**

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

Issues and Barriers:

With the publication of ISO 50001 – Energy management system standard, the framework for the integration of energy management concepts into business processes has been codified. The benefits of implementing an energy management system (EnMS) to large industrial facilities have been demonstrated through verified energy performance improvement at acceptable paybacks. Qualities of large industrial facilities that led to successful EnMS implementation include: top management commitment, past experience with management systems, and a history of successfully implementing energy efficiency projects

Less understood is the application of energy management concepts at sites where energy consumption is a significant operating cost with potential for savings, but current business operations and characteristics are not traditionally suited for an EnMS implementation. These operations and characteristics include: flat management structures, lack of onsite energy manager and tendency to outsource facility management functions, range of energy intensities, mix of owner/tenant occupied space, lack of familiarity with management systems, and lack of a dedicated utility account manager. These sites can be small to midsized industrial facilities, complex commercial sites, public buildings, or infrastructure sites. For these sites, it is essential to understand the current environment for implementing EnMS principles, including their:

- Current approach to identifying and implementing energy saving opportunities
- Processes for ensuring implemented energy saving projects are maintained
- Management and operating structure within which energy management concepts can be incorporated
- Resources available for dedicating to energy related issues

Initiative Description and Purpose:

This initiative will identify methods for introducing energy management concepts to energy consuming sites with potential for energy savings, but without an effective management structure to identify, implement, and sustain energy efficiency improvements. Example energy consuming sites that commonly exhibit these attributes, referred to hereafter as small to midsized enterprises, include: small to medium sized CA industries (<$2 million annual energy spend), complex commercial buildings, particularly those with large computing processes, mixed use data centers, public sector buildings (i.e. municipalities, educational), and infrastructure sites.

For the characteristic sites targeted by this initiative, it would most likely not be advisable to attempt to implement all the elements of an EnMS outlined in ISO 50001 at once. As a start, the sites should focus less on elements such as developing an energy policy and the formal internal auditing structures, and more on conducting an energy review, incorporating energy considerations into design and procurement specifications, and linking the actions taken to improve energy performance into operational controls. Elements of this initiative may include:

- Assessing the potential for implementation of energy management concepts at small to midsized enterprises
- Studying the barriers to implementation of energy management concepts at small to midsized enterprises
- Developing a framework suitable for small to midsized enterprises for continual energy performance improvement based on the plan-do-check-act cycle
- Demonstrating the value to utility and government agencies of implementing energy management concepts at small to midsized enterprises, particularly with respect to demand reductions
- Developing and testing a training program for energy engineers for use when consulting with small to midsized enterprises.

Stakeholders:

The following list of stakeholders may support this initiative:
- California Manufacturing Extension Partnerships
- Shipping ports
- California based US Department of Energy Industrial Assessment Centers
- California based IOUs

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)?

  The DOE-supported Superior Energy Performance™ (SEP) program has created an implementation model for an ISO 50001 EnMS and primarily demonstrated its benefits at large industrial facilities. The demonstration proved to be successful at these sites, as qualified by verified energy performance improvements and acceptable paybacks.

- 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.

  A study of 9 demonstration facilities for DOE supported SEP program showed on average, these facilities saved 0.174 TBtu and $500,000 per year at an average payback of 1.7 years. Additionally, it was found that 74% of the energy saving actions implemented by the nine facilities through the demonstration period were no cost actions[1].

[1] Peter Therkelsen, Ridah Sabouni, Aimee McKane, and Paul Scheihing. (2013). Assessing the Costs and Benefits of the Superior Energy Performance Program, 2013 ACEEE Summer Study on Energy Efficiency in Industry, Niagara Falls, NY

However, the payback for the smallest of the nine facilities studied was greater than 7 years, indicating that the EnMS implementation model for large facilities may not be the same for small and midsized facilities.

- 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.). See DOE supported Superior Energy Performance™ program

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.

This research will apply to most small to midsized enterprises in California. The enterprises represent a significant portion of California energy usage, employment, and businesses. Because it has the potential to impact a large customer base, it is appropriate for public funding.

Ratepayer Benefits (Check one or more)**:**

☒ Promote greater reliability

☒ Potential energy and cost savings

☐ Increased safety

☒ Societal benefits

☐ Environmental benefits - specify

☒ GHG emissions mitigation/adaptation in the electricity sector at the lowest possible cost

☐ Low emission vehicles/transportation

☐ Waste reduction

☒ Economic development

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

Industrial facilities certified to SEP improve their energy efficiency by an average 10% over business as usual activities. Energy Management business practices have the very real potential to revolutionize the way energy is uses and consumed in the state. Individual SEP facilities have cut energy consumption by 25%.

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.

As described above, this technology meets Code Section 740.1 (a) offer a reasonable probability of providing benefits to the ratepayers, (e)(1) environmental improvement through reduced water consumption and air emissions, (e)(3) reducing or shifting system load, and (e)(5) improving operating efficiency and reliability. It also meets Code Section 8306, the State's policy to modernize the electrical transmission and distribution system to maintain safe, reliable, efficient, and secure electrical service (b) dynamic optimization of grid operations, (c) deployment and integration of cost effective demand response and demand-side resources, (d) deployment of cost-effective smart technologies that optimize the physical operation of consumer devices.