

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

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**Title of Proposed Initiative: CENTRAL COAST INNOVATION CLUSTER**

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

- X Applied Research and Development
- X Technology Demonstration and Deployment
- X 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](http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/167664.PDF).

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

**Issues and Barriers:**

The success of research, development, and adoption of renewable energy technologies relies on the balance of market demand, economies of scale, and an understanding of costs and benefits by all stakeholders. Market design can best serve all stakeholders through transparency, adoption, and integration into grid operations. Today barriers to entry for new technologies and energy solutions for our community exist in the form of viability, reliability, metrics for comparison of competitive approaches, and an understanding of the research, development, and implementation process. This has resulted in a piece meal and less than effective adoption of technology solutions faced today and in the near and long term future for a core driver for our society; energy. What forms of energy we as a society choose to implement and use can be driven by market design, grid operations, and clean energy technologies. A clear process for research, development, and implementation an Innovation Cluster will provide solutions in a transparent and cost effective manner.

**Initiative Description and Purpose:**

How will this technology or strategy help address the issue/issues? Describe knowledge to be advanced to overcome critical barriers. Include the recommended funding level (minimum and maximum) for each project under this initiative.

The strategy for development of an Innovation Cluster for the Central Coast region is currently in progress across a variety of stakeholders and institutions. The team includes persons experienced with developing and launching incubators, accelerators, R&D laboratories, and other means and methods for migrating ideas to market. The proposed funding of \$1M per year for the duration of the EPIC program and will leverage many existing and proposed programs to develop a “game changer” in the Innovation Cluster approach to technology development.

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##### **Stakeholders:**

There are a number of local, regional, state, and Federal stakeholders with an interest in energy, entrepreneurship, innovation, efficient markets, and optimized grid operations. An initial list of organizations and institutions in the Central Coast region of California include (but is not limited to):

University of California Santa Barbara (Technology Management Program)  
Santa Barbara City College (Scheinfeld Center for Entrepreneurship & Innovation)  
Cal Poly San Luis Obispo (Entrepreneurship Resource Center)  
Goleta Entrepreneurial Magnet (GEM)  
Ventura Venture Technology Center (V2TC)  
San Luis Obispo Economic Vitality Corporation (EVC SLO)  
Launchpoint Technologies  
ESRI  
Maps.com (lead)

##### **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)?

There is extensive activity in entrepreneurship and innovation that will directly and indirectly benefit grid operations/market design at organizations and institutions in the Central Coast region and beyond. For a successful “Innovation Cluster” to develop and become sustainable the decision is not to judge the potential of a specific research or technology as to provide “fertile ground” for leading edge innovation to occur.

· 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.

Successes such as Silicon Valley (Bay Area California) have been challenging to replicate. Bringing technology from the lab to implementation has been studied extensively without identifying a coherent and repeatable process or approach. While there are a wide variety of examples of efforts (past, current, proposed) for bringing innovation to market, the challenge remains on identifying the resources and the “success ratio” for moving ideas to implementation.

· 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.).

Many of the stakeholders are involved with one form or another of entrepreneurship and innovation initiatives, with a wide variety of success and failure. Funding resources for these efforts are often internal although significant funding has been provided for innovation efforts from a variety of government and industry sources.

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##### 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.

Application of Entrepreneurship and Innovation to Grid Operations/Market Design; estimated size and energy use: Total Market.

- Quantifiable performance improvements for the proposed technology/strategy.

This proposal will address the issue of metrics and strategy for innovation and technology development. Solving this will result in a paradigm shift in how society evaluates and funds innovation.

- Maximum market potential, if successful.

Within the program parameters of five years, market potential is between \$5M and \$50M for the C2IC. Adoption and application beyond the Central Coast will have greater market potential (TDB).

- Number of direct jobs created in California.

The potential number of direct jobs within this program (Central Coast of California, over next five years, leveraging both existing and new incubators/accelerators/innovation clusters) created in California is 500+ based on 50 jobs per Innovation Cluster multiplied by the ten existing and potential incubators/accelerators proposed to be developed.

- Why this research is appropriate for public funding.

Innovation Clusters are where research “finds it’s wings”; it is expected that support for a Central Coast Innovation Cluster (eg; C2IC) will result in faster “time to market” for technologies that improve clean technologies, conservation (energy reduction), and the public’s understanding of the contribution innovation makes to society.

##### 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

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Qualitative:

Entrepreneurship and Innovation have been shown to be “game changers” in industry and society throughout human history. Today’s challenges in the energy arena deserve the focus and attention of those who will bring their imagination, enthusiasm, and energy to solving these issues for today and the future. Improving the “opportunity reward” by reducing the “cost of entry” serves society, the energy industry, and specifically those entrepreneurs involved.

Quantitative:

The economic multiplier for supporting programs in entrepreneurship and innovation are unclear. Examples exist, such as Stanford University/greater Silicon Valley area of 1000X return on investment over time. Also examples exist where the lack of such programs leads to economic stagnation and diminished value to society (the Detroit effect).

**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](http://www.leginfo.ca.gov/cgi-bin/calawquery?codesection=puc).

The strategy for support of innovation and entrepreneurship is well documented in the California Public Utilities Code; see sections 381.0 to 384.5 on Research, 399.11 to 399.32 on Renewables, 2830 on Renewables, 3365 to 3367.5 on Conservation, and other sections of the Code.