

DOCKETED**12-EPIC-01**

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To: **California Energy Commission**

From: **Santa Clara County, Office of Sustainability**

RE: **EPIC Second Investment Plan: Applied Research and Development;
and Market Facilitation Recommendation
Docket #: 12-EPIC-01**

Date: **February 13, 2014**

Thank you for this opportunity to submit funding recommendations for the next triennial plan under EPIC. We respectfully promote research into improved indoor air quality of energy efficient buildings, in support of Applied Research and Development, as well as Market Facilitation. Demonstrations of the causal link between energy efficiency upgrades and enhanced indoor air quality will serve a number of the State's principles and objectives, and influence market behaviors and uptake in efficiency upgrades. This line of research also promotes collaboration among academic, research, government and professional stakeholders, and is well-suited to leveraged funding and resources from other local and state agencies.

Deterioration of residential and commercial insulation, heating and cooling systems, and certain appliances, promotes infiltration and generation of airborne pollutants, including particulates (PM₁₀ and PM_{2.5}), carbon dioxide, carbon monoxide, and airborne fungal spores. Particulates, in particular, compromise public health and produce a number of potential impacts, including but not limited to exacerbation of existing respiratory and other chronic conditions, contribution to heart disease, lowered birth weights, and suppression of lung growth in children (South Coast Air Quality Management District and the California Air Resources Board). These impacts are compounded among at-risk groups, such as the elderly, chronically ill, or children (whose respiratory systems are still developing into pre-adolescence).

Energy efficiency market transformation, especially in the hard-to-reach existing buildings sector (both residential and commercial) is essential to the State's realization of its long-term strategic goals. A diverse, compelling, and measurable set of "value propositions" is a necessary resource for this conversion.

These efforts would provide value to energy efficiency program implementers, contractors, and outreach programs. Research results could also form the foundation of establishing energy efficiency values among trade networks (such as real estate professionals), induce greater private investment and lender partnership in upgrade initiatives, and serve as a compelling and persuasive tool for expanding the public's ability to connect energy efficiency with the highest priorities of families and businesses. Moreover, this research will create a body of data on the significant social and economic benefits energy efficiency distributes across communities.

Thank you for your time and consideration of this recommendation and, in advance, any role you may determine for it under the Applied Research and Development element to the 2nd Triennial Investment Plan.

If you have any questions about our recommendation, feel free to contact Demetra J. McBride at 408-299-6413, or at demetra.mcbride@ceo.sccgov.org.

**Title of Proposed Initiative** (Short and concise): **Economic and Social Benefits and Values Arising From the Impact of Energy Efficient Buildings on Enhanced Indoor Air Quality****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.

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

Issues and Barriers:

A diverse, relevant and compelling array of energy efficiency benefits – both tangible and economic - has not been sufficiently developed to stimulate network-wide public, personal, and private-sector investments. A merely superficial body of work that fails to establish diverse and measurable values also suppresses stimulation of critical partnerships with professional, trade, and financing institutions.

Initiative Description and Purpose:

Monetization of the human health, social and property-related benefits that arise in the nexus between energy efficiency upgrades in existing buildings and their positive impact on indoor air quality, will provide meaningful data to drive acceptance of energy efficiency as a personal, professional, and social priority.

Stakeholders:

As noted in our cover letter, this research will bring together academic, research, government, public health, and professional stakeholders.

Background and the State-of-the-Art:

- Using ARRA and County funding, the County's Office of Sustainability completed a trial pilot that did demonstrate significant, post-retrofit reductions in 4 indoor, airborne pollutants; and later commissioned a conversion of the data into preliminary monetization of the associated human health metrics.
- Due to funding and time limitations, the pilot described above focused on the proposition of a causal connection between energy efficiency upgrades and enhanced human health. More detailed and controlled testing and research is necessary, e.g., to assign specific values to discrete and bundled measures, long-term human health metrics and social health care cost avoidance, expanded monitoring, and testing of variable exposures.
- While we are not presently aware of specific programs that may leverage partnerships and resources in this area, we are confident that it is of value to a number of other state and national agencies, including but not limited to, the California Department of Public Health, the California Air Resources Board, the California Public Utilities Commission, the U.S. Department of Energy, and others.

**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 – *a system of accounting exists that converts data on enhanced human health impacts (human health metrics), and monetizes those impacts in activity, cost avoidance, and quality-of-life values, e.g., reduced public health care costs, reduced household health costs, increased missed work and school days, early morbidity and mortality, increased or exacerbated health impacts, child health development and impacts, exposure impacts, etc.*
- Maximum market potential, if successful – *The objective of these efforts is to create tangible, measurable and recognized value propositions to energy efficiency that represent personal, household, private sector, and community priorities and benefits. These values are potentially significant and substantial, and created “added value” to energy efficiency. Those messages have strong persuasive potential, not only in residential and commercial building sectors, but among professional and trade networks and lenders.*
- Number of direct jobs created in California
- Why this research is appropriate for public funding – *The benefits, even personal or household values, are in fact publicly shared and realized. No health cost is purely private, especially among underserved and moderate-income communities, or where health services are publicly-provided and funded. In addition, the results of this research is also applicable to public school systems, see outdoor air quality corollary in “**Air Pollution and Academic Performance: Evidence From California Schools**, University of Southern California (December 2009)*

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 – see above

Public Utilities Code Sections 740.1 and 8360:

This research and development/market facilitation initiative will: 1) provide benefits to ratepayers, 2) does not unnecessarily duplicate existing research efforts, and 3) supports environmental improvement, public employee safety, and conservation/efficiency objectives.