



California Energy Commission

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California Energy Commission  
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Re: Docket Number: 12-EPIC-01  
1516 Ninth Street  
Sacramento, CA 95814-5512  
**[Via email to docket@energy.ca.gov](mailto:doCKET@energy.ca.gov)**

**Comments of the California Center for Sustainable Energy regarding the First Triennial Investment Plan for the Electric Program Investment Charge Program**

The California Center for Sustainable Energy (CCSE) would like to thank the California Energy Commission (Energy Commission) for the opportunity to provide these public comments regarding the first triennial investment plan for the Electric Program Investment Charge (EPIC) Program. CCSE is pleased to see that funding has been authorized initially in the areas of Applied Research, Technology Demonstration and Deployment, and Market Facilitation. Investment in these areas is critical to ensuring the widespread deployment of next generation, clean energy technologies that provide ratepayer benefits and aid in meeting our state's clean energy goals.

For more than a decade, CCSE has been engaged in policies and programs aimed at transforming the state's clean energy marketplace, performing work across the continuum of technology adoption, from research and demonstration work to market support and facilitation activities. Our activities include the administration and implementation of multiple clean energy technology incentive programs, such as the California Solar Initiative (CSI), Self-Generation Incentive Program (SGIP), and Clean Vehicle Rebate Program (CVRP), as well as a number of market development and facilitation programs, including the Department of Energy (DOE) Better Buildings Program, DOE SunShot Rooftop Challenge Program, and most recently, statewide Marketing, Education, and Outreach (ME&O) for Energy Upgrade California (EUC). Together, these activities provide CCSE with cutting edge experience in the clean transportation, renewable energy, and energy efficiency markets, as well as with unique insight into the challenges faced by consumers, contractors, companies and local governments active in these markets.

It is clear that California is at a critical point in the transition to a clean energy economy, but the clean transportation, renewable energy, and energy efficiency markets have typically worked independently. CCSE's insight and experience enable an unparalleled view of future market facilitation opportunities and the ability to coordinate and transform these distinct markets into one cohesive movement. With the structural framework provided by the California Public Utilities Commission's (CPUC) Long Term Energy Efficiency Strategic Plan, as well as Assembly Bill (AB) 32 (Stats. 2006, Ch. 488) and AB 758 (Stats. 2009, Ch. 470), proper investment of EPIC Program funds will further support robust market research, deployment and facilitation across all three silos. Close coordination between federal, state, and local market actors will maximize the potential technology crossover opportunities as well as ensure proper prioritization of consumer and regulatory issues. Comprehensive market research and program tracking by a trusted third-party implementer, across all sectors, will strengthen education and outreach campaigns aimed at the contracting community. In turn, this will better inform the regulatory environment and provide assistance to state agencies and policymakers looking to realize a comprehensive vision of California's clean energy future with deep cuts in energy consumption and greenhouse gas emissions.

In keeping with this vision, CCSE offers the following recommendations to the Energy Commission for development of the first triennial investment plan for EPIC Program funds administered by the Energy Commission:

- I. EPIC Program Applied Research funds should be targeted towards integrating existing Smart Grid and electric vehicle charging technologies to provide wide-scale access to inexpensive electric vehicle charging infrastructure for ratepayers while minimizing utility costs.
- II. EPIC Program Technology Demonstration and Deployment funds should directly enable increased statewide data collection and sharing regarding pricing, consumer adoption, and technology diffusion trends to increase program effectiveness across all clean transportation, renewable energy, and energy efficiency programs.
- III. EPIC Program Market Facilitation funds should be utilized to incorporate data and lessons learned from existing pilots and programs throughout the state with the goal of providing more useful and effective stakeholder outreach information that directly addresses identified barriers to adoption with the ultimate goal of increasing adoption of these technologies.
  - I. **EPIC Program Applied Research funds should be targeted towards integrating existing Smart Grid and electric vehicle charging technologies to provide wide-scale access to inexpensive electric vehicle charging infrastructure for ratepayers while minimizing utility costs.**

Battery electric vehicle and plug-in hybrid electric vehicle (together known as "plug-in electric vehicles" or "PEVs") adoption rates are on the rise. As the size of this market and the

supporting charging infrastructure expands, it raises concerns over potential grid impacts, both on the local level where neighborhood clustering could create the need for expensive upgrades or replacement of distribution transformers, as well as at the level of the transmission and generation network. These potential downsides to expanded PEV adoption can be managed in part through effective rate design, where preferential off-peak charging is encouraged through lower marginal costs. However, technology-based solutions may also be available to complement price-based strategies. CCSE encourages the Energy Commission to fund research that evaluates the potential for leveraging the state's smart grid infrastructure to manage PEV charging.

Moreover, smart grid control of PEV charging could provide additional value to ratepayers when integrated with distributed solar photovoltaics (PV). California has made significant progress in the widespread adoption of distributed PV. In fact, installed capacity of distributed PV on some portions of the distribution system has reached high enough levels that there is some concern about potential negative impacts on grid stability. A solution may lie in the expanding PEV market. Because PEVs can be considered a "dispatchable" load, or flexible demand side resource, there is potential to enhance the value of distributed PV by coordinating PEV charging with renewable energy generation. This approach has potential at various scales of PEV and distributed PV penetration. For example, coordination of an aggregated group of PEVs connected to the grid in a workplace setting could be used to compensate for the increased ramp rate of large-scale solar generation facilities, or, alternatively, home-based PEVs could be used to compensate for the localized fluctuations in voltage as a result of high-penetration of distributed PV within a neighborhood circuit.<sup>1</sup> In both of these cases, the growth of the PEV market lends itself to increased penetration of renewables at potentially lower cost to ratepayers.

**II. EPIC Program Technology Demonstration and Deployment funds should directly enable increased statewide data collection and sharing regarding pricing, consumer adoption, and technology diffusion trends to increase program effectiveness across all clean transportation, renewable energy, and energy efficiency programs.**

In its Decision establishing the EPIC Program, the CPUC provides that activities eligible for funding under Technology Demonstration and Deployment include "strategies and other activities that are not specifically about the deployment of a technology itself, but are designed to test successful ways of encouraging customer adoption of clean energy technologies...."<sup>2</sup> CCSE supports this expansion of eligibility criteria and views it as an opportunity for meeting the stated goals of the EPIC Program.

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<sup>1</sup> A recent survey of PEV owners conducted by CCSE, in coordination with the Air Resources Board (ARB) and UC Davis, shows a substantial overlap between solar PV and PEV adoption. This overlap provides an interesting opportunity for studies evaluating the opportunity for integrated PV/PEV management at the neighborhood level.

<sup>2</sup> CPUC D.12-05-037, *Phase 2 Decision Establishing Purposes and Governance for Electric Program Investment Charge and Establishing Funding Collections for 2013-2020*, May 24, 2012, page 40.

Recent market transformation efforts within the state have shown the important role data can play in supporting customer adoption and program effectiveness. This linkage is best exemplified by California Solar Statistics <[www.californiasolarstatistics.ca.gov](http://www.californiasolarstatistics.ca.gov)>, the public reporting site for the California Solar Initiative (CSI). This website provides a comprehensive list of system level data for CSI projects, as well as summary program statistics in the service territories of the three large investor-owned utilities (IOUs). The depth, scope and credibility of data available through the site support customer participation in the market by providing direct access to market information. California PV customers have an unprecedented ability to compare active contractors and pricing for systems. The data is also used by industry to gauge trends in market share, business practices, and pricing, thereby creating a more competitive and effective marketplace. In addition, these data are a key resource to academia and policy makers at all levels, often serving as a foundational element of reports and research on the PV industry. Given the impact data availability has on consumer adoption specifically and the market more broadly, CCSE encourages the Commission to fund efforts focused on expanding the availability of clean energy technology data and the use of that data.

Expanded data sharing should be supported across the spectrum of EPIC Program focus areas. For example, with respect to distributed generation, there is a present lack of centralized reporting of project level data for the state's PV incentive programs. Currently, project level data from publicly-owned utility (POU) and small IOU PV programs are not included in California Solar Statistics. Using EPIC Program Technology Demonstration and Deployment funds to include these programs in existing reporting tools would improve the picture of distributed solar PV in the state and provide consumer benefits currently available in the service territories of the three large IOUs to those in the service territories of the POU's and small IOUs. Similar benefits could be gained from increased data availability in other focus areas, including residential energy efficiency and PEVs. On the energy efficiency front, redacted project level Energy Upgrade California data, similar to what is available through California Solar Statistics, would provide valuable insight into how the market is developing and the effectiveness of activities conducted by non-utility actors, such as local governments. This data would also provide customers a view of contractor activity and pricing, similar to that which is currently available or the solar PV market. Data transparency is even more important on the PEV front, where EPIC Program Technology Demonstration and Deployment funding could be used to make redacted vehicle level rebate data available to planners, utilities, industry, and consumers, to better anticipate and accommodate the expanding PEV market.

In addition to improving information access, EPIC Program Technology Demonstration and Deployment funds could be used to better understand how clean energy technologies are diffusing through the marketplace so that additional policies can be developed to spur further adoption as rebates and tax incentives begin to wane. The DOE recently released a funding opportunity under its SunShot Program focused on understanding technology diffusion. The Solar Energy Evolution and Diffusion Studies (SEEDS) projects will identify major drivers of consumer adoption and technology change. By either leveraging this work directly through match funding or by supporting complimentary research efforts, the EPIC Program can expand the knowledge of solar market dynamics in the state and more effectively sustain growth over

the long run. Additionally, the Energy Commission could fund similar research in the areas of residential building performance and PEVs, as these markets continue to expand.

Lastly, we encourage the Energy Commission to use EPIC Program Technology Demonstration and Deployment funds to better target energy efficiency programs. As the state expands its efforts in residential building performance, there is a growing need to more strategically focus resources on the areas with the greatest potential for energy savings. Energy consumption patterns viewed in conjunction with building characteristics and meteorological data can reveal important insights on the spatial distribution of energy retrofit opportunities. By supporting the analysis and dissemination of this information, EPIC Program Technology Demonstration and Deployment funds could help identify opportunities not only for more effective marketing and outreach, but also for the residential and commercial contracting communities to efficiently deploy resources.

**III. EPIC Program Market Facilitation funds should be utilized to incorporate data and lessons learned from existing pilots and programs throughout the state with the goal of providing more useful and effective stakeholder outreach information that directly addresses identified barriers to adoption with the ultimate goal of increasing adoption of these technologies.**

A major Market Facilitation need in the area of clean energy technologies is that of process improvement. As cash incentives and tax subsidies recede for established technologies like PV, the soft costs associated with adoption must be addressed by making the process correspondingly more efficient. This need is clearly illustrated in the design of the DOE SunShot Rooftop Challenge Program, which seeks to streamline and unify interconnection, permitting, net metering, financing and zoning standards and processes. At a national level, DOE estimates inefficiencies in these processes account for up to 40% of the average system's cost. Currently, there are four DOE-funded teams across the state working on this issue, including one led by CCSE. The Rooftop Challenge funding will expire in February of 2013, with no guarantee of Phase 2 funding. The Energy Commission, through the allocation of EPIC Program Market Facilitation funds, could provide significant support to expand this effort by developing and deploying a set of best practices and lessons learned to more jurisdictions across the state. EPIC Program Market Facilitation resources could be leveraged for Phase 2 match funding, ensuring a greater share of federal dollars for this important activity. Statewide EPIC Program funding to train inspectors, contractors and building officials would lead to greater consistency among and within jurisdictions, and statewide coordination, through online applications or databases and other ancillary support activities, would further increase the effectiveness of the effort.

Similar to distributed PV, there is a need for greater consistency and efficiency in the processes associated with the deployment of PEV charging infrastructure. In early 2011, the DOE funded six regions throughout California with an overall goal to accelerate the deployment of PEVs by aligning state and local policies. As part of this project, each of these regions is committed to

identifying barriers to PEV deployment, such as inconsistent permitting processes, and finding potential solutions. Building off of this project, the Energy Commission provided a second round of investment to the six regions funded by the DOE, as well as three additional areas throughout the state. This forward-looking investment allowed PEV planning to continue on the local level by establishing PEV infrastructure working groups that will continue improving processes set in motion with funding from the DOE. These efforts have led to significant improvements in key areas of the state, including Los Angeles, the San Francisco Bay Area, and San Diego. However, inconsistent permitting processes persist in secondary markets across California. In addition to permitting challenges, there are a host of issues hindering the market, such as utility processes and standards, which will take additional resources to resolve. Augmenting the Energy Commission's existing investment with additional funding from EPIC Program Market Facilitation funds will go far to help meet the state's ambitious goal of 1.5 million PEVs sold in California by 2020.

Another area of need in Market Facilitation pertains to utility electricity rates and the cost to "fuel" PEVs. Low-cost fueling of PEVs compared to conventional gasoline vehicles will be one of the primary drivers behind the growth of the PEV market. However, due to California's residential tiered rate structures, the average cost of electricity to fuel a PEV in California can be as high as \$0.24-\$0.34 per kilowatt-hour (kWh), equivalent to \$2.70-\$4.70 per gallon of gasoline. As a result, this benefit of PEV ownership is eliminated. Fortunately, special time-of-use (TOU) PEV rates are available through most utilities, which provide lower cost pricing for off peak charging of PEVs; however, there are several barriers that are inhibiting the utilization of these rates, including lack of consumer knowledge of PEV-TOU rates, lack of sufficient price elasticity in TOU rates, lack of submetering options in order to adequately track and differentiate PEV fueling from household electricity use, and the costs associated with submeter and second meter installations. If left unaddressed, these barriers will slow or halt PEV market expansion in California. In order to help address these barriers, CCSE encourages the Energy Commission to make EPIC Market Facilitation funds available to help facilitate access to low-cost residential fueling for PEV owners. Specifically, we recommend support of efforts to provide low-cost metering solutions for residential customers in order to easily and cost-effectively access TOU rates and to educate current and potential PEV consumers on the benefits of low-cost fueling and its effect on the total cost of ownership compared to conventional gasoline vehicles.

Market Facilitation is also needed on the energy efficiency front, particularly with regards to linking on-going, parallel building end-use efficiency and public health efforts. There is currently a proliferation of programs designed to address various building issues, including indoor air quality, mold remediation, noise remediation and energy efficiency; however, there is little if any coordination between these programs. For example, the Federal Aviation Administration's Quieter Homes Program performs deep retrofits on existing housing stock located in the flight path of major airports, replacing windows and doors, installing insulation, and upgrading mechanical systems. This program does not, however, employ the building science principles which form the basis of California's growing building performance industry. By supporting a convergence of these efforts, EPIC Program Market Facilitation funds can

support more efficient, safer homes and work towards a more holistic assessment of the myriad benefits resulting from building retrofits.

We are gratified to have the opportunity to provide these comments to the Energy Commission, and we look forward to further coordination with the Energy Commission and IOUs in the coming months in the development of their first triennial investment plans.

Sincerely,

A handwritten signature in black ink, appearing to read 'Sachu Constantine', with a stylized flourish at the end.

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