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Docket # 12-EPIC-01
Written comments on the EPIC investment plan proposal

To the commissioners and staff:

We respectfully submit these written comments on the EPIC proposal on behalf of the ENGAGE research group at the Institute of the Environment & Sustainability at the University of California, Los Angeles. Our comments address the role of behavioral programs under EPIC, as well as the need for data accessibility for the research community.

The ENGAGE research group has developed and implemented real-time energy monitoring and energy management feedback systems in UCLA dorms and multi-family housing, realizing energy savings of up to 20%. We have also conducted the most comprehensive quantitative analysis of the current experimental evidence on the effect of energy feedback on energy conservation, finding average energy savings of 9.7% across 108 field experiments.

There is clear evidence that behavioral programs can provide measurable energy savings. Furthermore, technology development does not happen in a vacuum. Therefore, **we urge the CEC to consider behavioral programs as an integral part of the EPIC program.**

Behavioral programs fall under the **market facilitation** efforts described in the EPIC proposal as including "program tracking, market research, education & outreach, regulatory assistance & streamlining, and workforce development to support clean energy technology and strategy deployment, […] including demand side management." Targeted behavioral programs deploying feedback based on metering data have **measurable and verifiable outcomes**, as opposed to generalized education & outreach programs.

Behavioral programs result in **direct ratepayer benefits**, and therefore address the **primary and mandatory guiding principle of EPIC**. Rate payers reap immediate benefits from these programs: every kWh they save results in a lower bill. Behavioral programs also provide indirect rate payer benefits. Assessing the reaction of different customer's categories to feedback will help target programs for cost-effectiveness. For example, devising strategies for lowering consumption among high on-peak users will benefit all customers, by mitigating rate increases across the customer base. Behavioral programs also reach customer segments that have been underserved by conventional energy efficiency programs. For example, renters in multi-family dwellings cannot use rebates for energy-efficient appliances, but there is potential for behavioral improvements in this sector.

While behavioral strategies appear promising, wide deployment of such programs requires an **investment in development and demonstration activities**. Currently, most electricity consumers receive low resolution feedback through a monthly bill. The massive deployment of more than 13 million digital electricity meters by 2015 across California (Edison Foundation, 2011) will allow utilities to provide a wealth of new information, unlocking new conservation potential. This substantial investment is not countered by an equally sound understanding of the behavioral change opportunities associated with these new technologies. Conventional advanced metering solutions focus on large information return to utilities. Cost-benefit calculations for smart meter technology are based on the expectation that customers reduce peak and overall energy usage when given more detailed information. Influencing conservation behavior is an afterthought, often based upon the belief that pricing incentives and information about conservation strategies alone will suffice to motivate conservation.

There is a clear need to **study the behavioral implications of energy use information in a more systematic way** to realize the promise of smart meter technology of financial savings and environmental improvements. Our research suggests that how energy use information is conveyed is important. In particular, there is much to learn about how programs can be targeted to consumer groups with the highest potential for conservation to maximize cost-effectiveness. A further objective is to test persistence of energy saving behavior after intervention. Under continued feedback, will residents habituate and eventually return to baseline? If feedback is removed, will effects persist? Answering these questions is essential to developing **measurable and verifiable behavioral programs**.

Behavioral programs are mapped to the **utility value chain**, by providing demand side energy management services. Behavioral programs are **low cost**, benefitting from the on-going roll-out of smart meter technology across California. Behavioral programs are rapidly deployable, inherently scalable and do not depend on technology adoption cycles.

There is also evidence that the effectiveness of such programs is enhanced when they are part of sophisticated energy management systems. The analysis of conservation behavior needs to be coupled with the development of energy management technology. Technology development and deployment does not happen in isolation from behavior. Understanding how technology is used is important, because there are **feedback loops between technology and behavior**. For example, much can be learned about interface design for real time feedback from studying how customers make use of energy information. Behavioral programs allow for improving the technology based on feedback from customers, which is especially important given that EPIC will focus on technology demonstration and deployment.

Currently, efforts to gain a better understanding of the potential for behavioral programs to reduce energy use are hampered by the lack of data. The academic community can contribute to developing and scaling such programs, but this will require access to smart meter data for research purposes.

Behavioral programs are very much aligned with CEC goals in tapping the immense, low-cost potential of smart meters to contribute to lowering energy demand and emissions, while providing ratepayer benefits. We hope you will consider our request to include such programs under EPIC.

Thank you for your consideration.

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