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CalPlug Comment on EPIC 4

Additional submitted attachment is included below.

August 17, 2021

Chair David Hochschild
California Energy Commission
1516 Ninth Street
Sacramento CA 95814

Subject: Comment on the CEC EPIC Investment Plans 2021-2025

Dear Chair Hochschild,

CalPlug is encouraged by the inclusion of **Initiative #32: SEMS for Homes** in the draft EPIC 4 Investment Plan. Integrated Smart Home Energy Management Systems (SHEMS) are increasingly being considered for inclusion in utility incentive programs throughout the U.S. These holistic management systems show great promise for improving energy efficiency while also incorporating flexible load capability through response to relevant grid and rate signals. This interest is also aligned with federal policy, as the EPA has recently implemented an ENERGY STAR program for SHEMS. Addressing interoperability challenges through supporting open communication protocols and improving user interface design are furthermore important to gain traction for SHEMS in the market.

However, CalPlug would like to emphasize that technology solutions are only one part of the challenge of advancing SHEMS. Customer adoption and effective usage is also a product of understanding user experience, behaviors, and preferences. CalPlug urges the Energy Commission to request inclusion of behavioral research, such as user surveys and observational experiments, in proposed SHEMS pilot programs. Assessing the ways in which people interact with SHEMS products during their daily lives is critical to ensure that the devices work as intended and are cost effective as deemed measures for future utility programs. For example, one study for PG&E and SDG&E on Tier 2 APS devices showed a persistence rate of 78% among subjects who reported that the APS unexpectedly shut off the TV while in use compared to 91% among those who did not experience such interruptions, indicating the importance of proper installation and control protocols. Including demand side analysis of grid signals mediated by smart connected devices is as important to the success of programs such as TOU and flex alerts/load shedding events as managing the utility supply side.

Similarly, CalPlug is very supportive of the Energy Commission's continued focus on commercial building control systems/BEMS to manage large HVAC loads. Looking ahead, plug loads will increasingly make up a greater percentage of building energy loads, as HVAC and lighting controls continue to be optimized with existing EMS/BEMS infrastructure. CalPlug encourages the Energy Commission to fund more research on the effectiveness of commercial plug load management systems, both in terms of future inclusion for utility programs, and in support of the controlled outlet requirements currently mandated for California commercial buildings under Title 24. As

found with HEMS, CalPlug's review of BEMS research suggests a strong user behavior component to product acceptance. For example, NREL achieved an estimated 47% savings for plug and process loads using advanced building controls in one field study, but savings were contingent on user behavior; NREL concluded that understanding users' interactions with plug loads is key to developing energy management systems that function within natural workflows. Future testbed and pilot studies of building control systems should similarly include surveys of building managers, owners, and tenants, as well as appropriate knowledge transfer activities to train occupants on the functions and engagement with newly installed building controls.

Thank you for the opportunity to provide comments regarding the EPIC 4 Investment Plan. CalPlug applauds and supports the Energy Commission in our shared goal of realizing a cleaner California.

Sincerely,



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