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CALSTART Comments on EPIC 3rd Triennial Investment Plan

Additional submitted attachment is included below.

DATE: March 20, 2017
TO: Laurie ten Hope, Deputy Director, Energy Research & Development Division
FROM: Ryan Schuchard, Policy Director
RE: Electric Program Investment Charge 3rd Triennial Investment Plan

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Dear Ms. ten Hope,

Thank you for this opportunity to provide comments on the Electric Program Investment Charge (EPIC) 3rd Triennial Investment Plan (3rd Plan). CALSTART commends the Energy Commission (CEC) for its critical work investing in the transformation of California's electrical grid for the benefit of all Californians.

By way of an update, during 2016, CALSTART established the Commercial Electric Vehicle Working Group (CEVWG), which has convened leading commercial electric fleet operators (AmeriPride, Foothill Transit, Frito Lay, Monterey Salinas Transit, San Diego Airport Parking Company, Santa Barbara MTD, Santa Clara Valley Transit Authority, and UPS) and electric vehicle technology providers (ChargePoint, Complete Coach Works, Motiv Power Systems and SunEdison) to share information about electrification costs and impacts in a series of dialogue with utilities, for the purpose of informing win-win solutions that accelerate widespread transportation electrification under SB 350.[1]

SB 350 requires Investor Owned Utilities (IOUs) to electrify transportation. While doing so creates enormous societal benefits, taking active measures to accelerate the movement of transportation from petroleum fuel to electric drive is putting new strain on the grid, especially in the case of medium and heavy duty vehicles. For example, the load from 35 transit buses charging at once is around 2.1 MW, the same as San Francisco's 48-floor Transamerica Pyramid Building.[2] A fleet charging these vehicles together will create significant impacts for the electrical grid if not properly managed, and will incur demand charges that lead to higher fuel costs than petroleum.

In response, fleets are asking for relief from demand charges, which two of the three IOUs have provided options for in their initial SB 350 applications. However, elimination of demand charges is a partial fix that is justified by the temporary goal of encouraging early-movers. A long-term solution will require suites of technology (e.g. distributed generation and onsite storage), management (e.g. control strategies), and vocation-specific rate-design approaches that have not yet been tested.

CALSTART believes that electric vehicle grid integration (VGI), which CEC has emphasized in previous investment plans, should be an even higher priority for EPIC, as advances in VGI are vital to effectively transitioning vehicles from internal combustion to electric drive—and to securing the greenhouse gas reduction and grid benefits that doing so offers. In particular, CALSTART recommends that CEC bolster its VGI investments for the 3rd Plan by specifically focusing on medium- and heavy-duty (MHDVs). To that end, we provide the following recommendations on each of the EPIC investment categories for your consideration.

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[1] CALSTART (2016) Commercial Electric Working Group: CALSTART Briefing for California Air Resources Board
[2] CALSTART (2015). Electric Truck and Bus Grid Integration: Opportunities, Challenges, and Recommendations

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Applied Research & Development

In the 2nd Triennial Investment Plan (2nd Plan), the "Applied Research and Development" category specified that a strategic objective was advancement of EV infrastructure to provide electricity system benefits. CALSTART supports this objective and its continued inclusion as a priority for investment, which would best fit under Theme 3, "Increase System Flexibility from Low-Carbon Resources".

With sufficient incentives, we can expect the 500-700 electric MHDVs on California's roads today to grow ten-fold over the next few years, which will correspondingly lead to significant new load on the grid. To maximize the effectiveness of grid integration, we believe it would be beneficial to conduct an assessment of future energy demand and needs for the grid in light of anticipated new MHD EV loads in order to ensure that fleet charging does not result in counterproductive and unnecessary load spikes. Assessment activities could include:

- Studies on strategic, phased approaches for "grid friendly" charging solutions for electric buses, the beachhead of MHD electrification;
- Roadmaps for regional infrastructure rollout to support electric MHDVs, including a study of South Coast MHDV infrastructure needs and opportunities for achieving widespread electrification over multiple time periods to 2030, focusing on the charging costs and behaviors of fleets from different beachhead segments, and barriers that stand in the way of widespread adoption; and
- Evaluations of areas where grid infrastructure is more and less prepared to handle spikes in MHD EV traffic, and where the more than major investments at are being proposed by California's three largest investor-owned utilities (IOUs) in the SB 350 proceeding are more and less likely to accelerate commercial electrification in the near term.

Given the pertinence of this issue via the IOUs' investments, CALSTART recommends creating a new category under Theme 3 that specifically focuses on research related to MHDEV integration and load management. With over $1 Billion of utility investments in infrastructure being considered by the California Public Utilities Commission, now is the time to make a fresh and new examination of top R&D needs surrounding electric MHDV impacts on the grid.

Technology Demonstration and Deployment

In the 2nd Plan, the "Technology Demonstration and Deployment" category specified the expansion of smart charging and vehicle-to-grid power transfer for EVs as a strategic objective, along with demonstrating advanced energy storage interconnection systems. CALSTART supports the continued inclusion of these strategic objectives in the 3rd Plan.

One of the other chief barriers fleets face in adopting commercial EVs is expected increases in fuel costs as a result of demand charges. All seven members of CALSTART's CEVWG who operate commercial vehicle fleets, said that demand charges are a barrier which stands in the way of their efforts to adopt MHD electric vehicles. While SCE and SDG&E are currently proposing new rates to the CPUC that reduce demand charges temporarily, it is evident that a long-term solution will require a suite of control technologies and perhaps combinations of distributed generation and onsite storage. We

recommend investments in demonstration projects that explore a range of demand management strategies by both transit and goods movement fleet operators.

Furthermore, the "Technology Demonstration and Deployment" category also supports microgrids as a critical area of investment. CALSTART agrees; microgrids, especially those that utilize EVs, have enormous potential, but have yet to reach the stage of commercialization. Therefore, CALSTART recommends that the CEC continue to support investment in microgrid demonstration with VGI in the 3rd Plan.

Market Facilitation

In the 2nd Plan, the "Market Facilitation" category specified investments and decision-making through market and technical analysis as a strategic objective. CALSTART supports continued inclusion of this objective as an investment priority. CALSTART recommends including this category of research and investment as a part of Theme 7 of the Draft Funding Initiatives, specifically "Identifying Pathways for Achieving California's Energy and Climate Goals".

Technical studies of the barriers to deployment of critical technologies will be key to unlocking commercial deployment for purposes of reaching California's energy and climate goals. Such studies are especially pertinent in context of the large-scale EV infrastructure investment being proposed by IOUs in the CPUC SB 350 proceeding. Market and technical analysis activities should include:

- Study on the lessons learned from the $60 million portfolio of fast-track pilot projects currently being proposed in the SB 350 proceeding by IOUs;
- Study on opportunities for existing commercial EVs to increase their utilization of grid infrastructure in periods of high generation and in turn decrease costs to ratepayers; and
- Study on potential regional grid benefits for pilot projects with regional freight, drayage, and last mile, specifically in the San Joaquin Valley and South Coast.

CALSTART sincerely appreciates the opportunity to provide comments on the development of the 3rd Plan. We are excited to see continued investment in EVs as a groundbreaking technology that transforms the way we understand and use our electrical grid, to the benefit of all Californians.