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Greenlots Comments on EPIC Investment

Additional submitted attachment is included below.

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The Energy Commission is currently soliciting ideas and stakeholder input for the 2018 – 2020 EPIC Triennial Investment Plan. For those that would like to submit an idea for consideration in the 2018-2020 EPIC Triennial Plan, we ask that you complete the form below. Submittals are due **by 5:00 p.m. on February 10, 2017.**

Part 1. Initiative Description and Purpose:

1. Please provide a brief description of the proposed initiative:

This proposed initiative can be thought of as a multi-layer value stream for disadvantaged communities, falling under the category of technology demonstration and deployment projects. The overall goal of this proposed initiative is to have measurable impact and growth of EV penetration in disadvantaged communities across California.

The first aspect of this framework is to install high power DCFC stations combined with storage in these communities. These can be in the workplace, at home, and in multi-unit-dwellings. This step alone provides infrastructure support for communities to have the confidence and make it feasible to own/use/operate EVs. However, the added benefit of this infrastructure is that these DCFC paired with storage can provide grid services. In the event of power outages, disadvantaged communities are impacted disproportionately. Utilizing the DCFC paired with storage in a way that supports back-up power in the event of an outage, can allow for the community to have power during an outage. The stations can be situated in a way that creates a community hub, where the stored energy is used in a focused manner during an outage. Also, especially important during an outage is the ability to remain mobile and have transportation. With storage, the power can be available in an outage to still charge electric vehicles to maintain mobility during an outage.

The second aspect of this framework is to collaborate with automakers and/or ride sharing services to coordinate strategies that allow greater access of EVs to targeted communities. As ride sharing services utilize EVs in a greater number, incentivizing them to charge in disadvantaged communities, and then offering rides to passengers in those communities affords greater exposure and use of EVs by residents in disadvantaged neighborhoods.

2. What technical and/or market barriers would the proposed initiative help overcome? For scientific analysis and tools, what knowledge gaps would the proposed initiative help fill?

There are fundamental market barriers that impede most people from owning or using an EV. This is especially true however for residents with low to moderate income, living in disadvantaged communities. This initiative aims to overcome the market barriers preventing residents with low to moderate income, living in disadvantaged communities from being able to have exposure to and/or use/own EVs.

It is crucial that first the infrastructure be developed in these neighborhoods. In doing so, it is wise to include infrastructure that provides additional grid services besides EV charging, such as power outage support and creating energy storage for renewable generation sources during mid-day. Creating these multi-layer value streams allows for the infrastructure to be useful, even while EV adoption in these neighborhoods may remain slow.

Another aspect this initiative aims to solve is the concept of vehicle ownership in low to moderate income neighborhoods. Working with automakers and ride sharing service companies, disadvantaged communities can gain greater access to transportation services in general by creating partnerships where these vehicles charge and offer rides from the neighborhood.

This initiative also aims to discover new ways to incorporate second life batteries into storage systems that allow EV mobility to be maintained during power outages.

Part 2. Benefits and Impacts

3. If this initiative is successful, either fully or partially, what would be the expected impact? Who are the primary users and/or beneficiaries?

The expected impact would be to significantly increase the awareness and understanding of EVs with residents living in disadvantaged communities. Fully, a successful initiative would transform the transportation characteristics for residents in these neighborhoods, by creating new transportation services and/or vehicle ownership/use models.

The primary users and/or beneficiaries are residents with low to moderate income living in disadvantaged communities. Residents in these communities gain access and exposure to EVs, as well as receive grid services in their neighborhood that assist in times of power outage.

Additionally, ride sharing services, and automakers can benefit from having increased infrastructure to support EVs. Similarly, a targeted effort through the CEC to promote EV adoption in disadvantaged communities, better assists and aligns with goals of other agencies to create incentives for low to moderate income residents to adopt EVs. Having the infrastructure to spur EV growth and adoption in disadvantage communities, allows residents to fully participate in other state initiatives that push to incentivize such adoption.

4. Describe what quantitative or qualitative metrics or indicators would be used to evaluate the impacts of the proposed initiative:

Qualitatively, this initiative would result in larger numbers of residents living in disadvantaged communities to understand and gain exposure to EVs. Making people more comfortable with EVs as a form of transportation could be measured by targeted surveys. However, it is important to understand that qualitative data is often difficult to collect accurately and objectively. Overall, people being exposed to these stations would greater understand the coordination behind using an EV, such as how to charge it, as well as the typical range and battery use characteristics of various driving trips. These qualitative metrics are important to gain to increase EV adoption.

Quantitatively, metrics to evaluate the impacts of this initiative include, increase in EV adoption, number of chargers deployed, amount of storage deployed, total energy stored and consumed from the charger locations, renewable energy utilized during peak production, number of EVs in these communities before and after installation, number of grid power outages and subsequent hours power is supplied from storage systems, economic impact of reducing impacts from power outage, number of hospital incidents or emergency responses during power outages.

5. Please provide a list of peer-reviewed references that support the responses for questions 3 and 4. Proposed initiatives that include peer-reviewed references will be given stronger consideration.

6. (For technologies only) What competitive advantages does the proposed technology solution have over current benchmark technologies? If the technology is beyond the prototype stage, what strategies do you suggest to bring to scale?

DCFC paired with storage has successfully been deployed, so this technology is beyond the prototype stage. However, incorporating second life batteries into storage/charger sites into disadvantaged communities while being tied into the grid to offer grid support services has the competitive advantage of adding multiple value streams to these charger stations, especially to ensure that power is available for EVs during power outages.

Additionally, various state agencies have worked to promote more robust use and adoption of EVs, particularly among residents living in disadvantaged communities. Working to deploy the infrastructure in these neighborhoods, and building the confidence of mobility with EVs, allows for greater success of these state incentive programs.

One more item, is this approach aims to take a first approach at transforming the vision of mobility, not only in disadvantaged communities, but overall. This project can build the understanding behind partnering with automakers and ride sharing apps to build the future of transportation and mobility.

Part 3. Connection to Energy Commission's EPIC Framework

Energy Commission staff have developed a draft strategic framework to guide the CEC's planning and implementation of EPIC across triennial investment cycles. One of the objectives of the draft strategic framework is to communicate a consistent set of priorities for organizing current and future EPIC investments.

7. Please indicate which of the following strategic framework themes you feel the proposed initiative best fits within:

- Advance Technology Solutions for Deep Energy Savings in Building and Facilities
- Accelerate Widespread Customer Adoption of Distributed Energy Resources
- Increase System Flexibility from Low-Carbon Resources
- Increase the Cost-Competiveness of Renewable Generation
- Create a Statewide Ecosystem for Incubating New Energy Innovations
- Maximize Synergies in the Water-Energy-Food Nexus
- Develop Tools and Analysis to Inform Energy Policy and Planning Decisions
- Catalyze Clean Energy Investments in California's Underrepresented and Disadvantaged Communities

The proposed initiative best fits with the two following strategic framework themes:
- Catalyze clean energy investments in California's underrepresented and disadvantaged communities, and
- Increase system flexibility from low-carbon resources

By pairing storage with DCFC in disadvantaged communities, California proliferates multiple value streams for residents living in disadvantaged communities. Allowing for greater clean energy investments, and allowing the storage systems to increase flexibility to accommodate greater load use of renewable resources and distributed energy resources.