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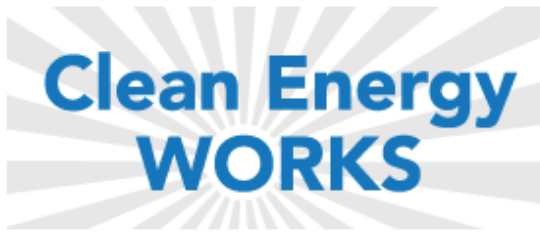
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Clean Energy Works Comments on VGI Roadmap Update

This filing supersedes TN# 225947 submitted on 11/21/18.

Additional submitted attachment is included below.



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November 21, 2018

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Regarding revisions to the VGI Roadmap (Docket 18-MISC-04):

Clean Energy Works appreciates the opportunity to provide comments to the California Energy Commission (CEC) on the VGI Roadmap Matrix to inform the preparation of a Draft VGI Roadmap. Clean Energy Works is a non-profit organization that provides advisory services to policy-makers, public interest groups, and companies interested in rapidly scaling up investment in clean energy. The Global Innovation Lab for Climate Finance has specifically recognized our work on financing solutions for clean transport as one of the top innovations of 2018 to mobilize needed investment for low-carbon development, and our work prioritizes attention to electric heavy duty vehicles that provide shared mobility services because they already have strong business case compared to all other electric vehicle types.

Summary of Recommendations for the VGI Roadmap:

- 1. The VGI Roadmap should recommend the CPUC and POU's approve the introduction of utility on-bill investment programs for EVs, starting with HDV fleets that include transit buses, school buses, rideshare fleets, and any others with a cost effective value proposition.**
- 2. The VGI Roadmap should recommend the CEC assist any stakeholders that can catalyze complementary private capital investment in school bus electrification, amplifying the impact of the School Bus Replacement program as a source of ready-made demonstration sites for solutions developed to address many other Problem/Issues in the VGI Roadmap Matrix.**

The Priority level assigned to these recommendations should be HIGH, as defined in the VGI Roadmap Matrix, which specifies imminent resolution (0-1 years) is required due to high risk of impairing integration and deployment, and requires the reallocation of existing resources.

Full Comment

The VGI Roadmap was initially developed to serve an ultimate goal of improving stakeholders' ability to integrate plug-in electric vehicle charging into California's grid.

According to the 2017 IEPR, the rationale for updating the existing VGI Roadmap includes "the need to... return the value of grid integration to stakeholders."

Within the VGI Roadmap Matrix, we underscore the significance of **Goal 14**: Align stakeholders' interests in robust open markets for smart infrastructure investment.

The Problem/Issue statement within the Matrix for this Goal currently states:

"The traditional "rate of return" regulatory designs may cause utilities to underestimate the grid impact mitigation potential from smart charging infrastructure and grid upgrade planning methodologies may need to be updated. Regulatory changes that accommodate and encourage third party aggregation of charging may be needed. It may be necessary to allow utilities to consider criteria for performance-based ratemaking or other incentive mechanisms to balance the objectives of infrastructure investments, renewable integration, minimizing ratepayer impact, and encouraging marketplace competition."

This Issue statement obscures two important roads that need to be a part of the updated VGI Roadmap:

1. **Introduction of utility on-bill investments** can catalyze much faster electrification by capitalizing the value of the on-board battery (and charging station that connects it to the grid) using private capital that is deployed and fully recovered on a site-specific basis.
2. **Harness the School Bus Replacement program**, a historic surge in California spending on the direct procurement of EV HDVs, to achieve a critical density of grid connected storage on specific circuits in order to solve many other Problem/Issues in the VGI Roadmap Matrix.

The first of these roads could more than triple the impact of the second, so it is important to consider them together.

1. Introduction of Utility On-Bill Investments

In December 2016, CEC's landmark Barriers Study that was mandated by SB350 concluded that financing is a barrier to the participation of low-income communities in the benefits of the clean energy economy. This is also true for school districts in disadvantaged communities,

which is consistent with the CEC's decision to prioritize state grant funds to pay for replacement of diesel school buses in disadvantaged communities.

However, in the Barriers Study, the CEC's top recommendation for overcoming the barrier to financing was for every type of utility in the state (IOU, POU, etc.) to introduce a demonstration of utility on-bill investments. This can be accomplished through a terms of service agreement (tariff) that is distinctly different from a loan (e.g. IOU on-bill programs today) or a lease (e.g. solar leases to qualifying counterparties) or a lien-backed loan (e.g. PACE). Several state utility commissions have already approved the use of tariffed on-bill programs for energy efficiency upgrades in buildings, and CEC called upon the CPUC to consider approving demonstrations of the same type of approach in California.

In September 2018, the Global Innovation Lab for Climate Finance endorsed the application of this same approach for the first time in transportation, starting with EV HDVs for shared mobility applications. Transit bus fleets have the best business case among them, but when the value of VGI-enabled services are taken into account, the business case for school bus electrification improves dramatically. This underscores the connection between the two recommendations highlighted in this comment for the VGI Roadmap.

Clean Energy Works is the primary proponent for this financial instrument, called [PAYS for Clean Transport](#). After six months of rigorous due diligence, the Global Innovation Lab for Climate Finance published its financial instrument analysis underpinning its endorsement here: https://www.climatefinancelab.org/wp-content/uploads/2018/02/PAYS-for-Clean-Transport_Instrument-Analysis.pdf

In short, it found that a utility on-bill investment program limited to the on-board battery and charging equipment that connects to the grid could drop by more than 90% the amount of subsidy, incentives, or grant funds required to overcome the first cost barrier to the procurement of transit buses. The result is a large multiplier effect on the amount of capital flowing into clean transit deployment for each dollar of public funds spent, reaching a ratio of up to 70:1 in some of the 6 international markets considered. The application of the same financial instrument can help align stakeholder interests around VGI benefits in the LDV market segments as well, catalyzing more smart investment in that infrastructure as well.

Why should the VGI Roadmap contemplate a recommendation on financing as part of the path ahead? The ability to capitalize the value of on-board storage with VGI-enabled revenue streams can powerfully accelerate the pace of electrification itself through reduction in first cost of qualifying EVs. In turn, that will open more opportunities for third-party aggregators and other solution providers who need a much higher pace of market penetration in order to resolve many of the Problem/Issues in the VGI Roadmap Matrix. Omitting a recommendation on the role of California utilities in catalyzing investment in EV deployment ultimately would imply a slower path of progress toward the goals set forth in the Roadmap itself.

Recommendation for the VGI Roadmap:

The VGI Roadmap should recommend the CPUC and POUs approve the introduction of utility on-bill investment programs for EVs, starting with HDV fleets that include transit buses, school buses, rideshare fleets, and any others with a cost effective value proposition.

2. Harness the School Bus Replacement program

The first places in California that are likely to achieve a 1 MW or more of dispatchable V2G storage on a single circuit are school bus depots with only 10 buses each.

These places represent an incredibly valuable platform for testing solutions to many other Problem/Issues in the VGI Roadmap Matrix.

While several pilot projects for V2G school bus deployments have been approved in California, New York, Florida, and elsewhere, it is critical to move beyond the technology demonstrations to also introduce innovation in utility business models that *align stakeholder interests in robust open markets for smart infrastructure investment*.

In particular, the VGI Roadmap should recognize the hazard of missed opportunity in California's own infrastructure investment in school transit that is plain sight.

In the next year, the California Energy Commission is poised to award approximately \$75 million in grants through the School Bus Replacement program that will be complemented by as much as \$25 additional grant funds from CARB through the HVIP program. The grant funds are slated to be awarded with priority given to disadvantaged communities, and more than two dozen school districts will win these the opportunity to deploy these EV HDVs.

In total, Californians are going to use public funds to spend \$100 million in the next year on the public procurement of this single type of heavy duty electric vehicles that altogether could have more than 30 MWh of grid-connected storage. And even with those impressive figures, the use of these grant funds alone would be sufficient to convert barely more than 1% of California's school bus fleet. Those figures are the minimum level of impact in a scenario where every vehicle is procured *only* with state grant funds - as if the vehicles themselves have no value that could recover any of that cost.

Reiterating the first recommendation above, there is clear potential to finance the value of the on-board battery and charging station that connects it to the grid, and the VGI Roadmap could play a vital role in accelerating the policy and planning that would advance the aims of the Roadmap itself.

Through the implementation of the School Bus Replacement program, California could harness its unprecedented surge in public spending on EV HDVs to leverage more private capital. The potential for on-board batteries to earn revenue for VGI-enabled services can be used to secure more private capital, which in turn results in accelerated technology deployment. This would effectively accelerate the pace of deployment in service of the state's electrification goals and commitment to disadvantaged communities. The higher pace of investment and technology deployment drives learning curves that affect the pace of technology cost reductions.

This virtuous cycle can directly affect the pace at which California can make progress on the implementation of its Roadmap. The sooner California has more sites with VGI-enabled battery storage at a scale that can be valued by CAISO or by POUs, the sooner many of the other Problems/Issues raised in the VGI Roadmap Matrix can be addressed.

What scale could this multiplier effect reach? Preliminary estimates of the cost effectiveness indicate that total scale of capital deployed for EV HDVs through the CEC's own School Bus Replacement program could be more than tripled, topping 100 MWh of grid connected storage in dozens of locations that each would have installed capacity sufficient to qualify for participation in the CAISO or provide services directly to vertically integrated POUs.

Through the research and development programs already funded through CEC, CARB, and other state agencies, resources should be allocated to investigate the applicability of innovative finance instruments to amplify the impact of the EV HDV deployment sponsored by the state, which also will affect the number of sites with VGI-enabled services available at a scale above the threshold required to access value to the grid in the wholesale markets.

Recommendation for the VGI Roadmap:

The VGI Roadmap should recommend the CEC assist any stakeholders that can catalyze complementary private capital investment in school bus electrification, amplifying the impact of the School Bus Replacement program as a source of ready-made demonstration sites for solutions being developed to address many other Problem/Issues in the VGI Roadmap Matrix.

We welcome the opportunity to confer further with the CEC and all participating agencies developing the revision to the VGI Roadmap on these topics.

Respectfully submitted,



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Principal, Clean Energy Works