

**Via Electronic Mail**October 30<sup>th</sup>, 2019

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**RE: Massachusetts 2019 Clean Peak Energy Standard**

## Introduction

The Clean Peak Energy Standard could be a great step towards greenhouse gas emission reduction. However, given our experience in storage policy analysis and energy technology deployment, we believe there are several improvements to the proposed policy framework that could enhance this already valuable effort and help it reach its full potential.

For nearly 20 years, the University of Delaware's EV (Electric Vehicle) Research and Development Group (EV R&D Group; alternatively, "the EV Group") has investigated EV market penetration and performed analyses of the policies necessary to allow for V2G (Vehicle-To-Grid) integration.

V2G-enabled EVs can export energy from their batteries and therefore can provide valuable services to the electric grid. These services include smoothing the variability of solar and wind, stabilizing the continual fluctuations of supply and demand, and reducing the need for expensive natural gas plants by offsetting peak loads. The EV Group's Principal Investigator, Dr. Willett Kempton, founded the V2G concept and the EV Group has demonstrated and licensed V2G technology. The recommendations made here are therefore based on extensive experience within this field.

EV R&D Group fully supports Massachusetts Department of Energy Resources' efforts to tackle emissions and promote clean and renewable energy sources. We commend the DOER acknowledgment that EVs could be a part of the Clean Peak Standard as demand resources. However, the language suggests that V2G-capable EVs are also able to qualify for Qualified Energy Storage System (QESS), but this is not yet fully specified and should be made explicit. This comment will focus specifically on how to properly integrate V2G in this standard.

## Evaluating Qualified Energy Storage System Criteria

The proposed criteria allow V2G-enabled EVs to operate as either a QESS or a Demand Response Resources. We here comment on the fourth QESS criteria (labeled "(d)") as it could provide the largest opportunity to reap the benefits of V2G to support the objective of the Clean Peak Standard.

According to the Clean Peak Standard proposal, a resource can meet QESS criteria (d) through the "inclusion of an operational schedule in the Qualified Energy Storage System's Interconnection Service Agreement demonstrating that the Qualified Energy Storage System serves to resolve load flow or power quality concerns otherwise associated with intermittent renewable energy resources."

This system of using an operational schedule for the deployment of V2G-enabled EVs, as established through an Interconnection Service Agreement is already in use in Delaware. The University of Delaware has deployed V2G-enabled EVs within the PJM frequency regulation market since 2011.

This is done by submitting weekly operational schedules to our Conservation Service Provider (CSP) that indicate how much aggregated capacity we will bid each hour. Our CSP then inputs this schedule into the PJM portal. During the scheduled hours, our fleet of EVs will charge, discharge or idle depending on the second-by-second signal from PJM. We are compensated based on our capacity bids, our performance in responding to the signal, and the market clearing price.

This can easily be modified and adopted within the QESSs Interconnection Service Agreement in a variety of ways to better reflect the goals of the Clean Peak Standard. However, there is no proper tariff structure.

Currently, transmission-connected storage systems pay for their charging energy, and receive credit for export, within the same (wholesale) rate scheme. However, distribution-connected storage systems do not have the equivalent tariff structure, because retail credit for export rates do not match debit for consumption rates (at equivalent time of day). We recommend establishing such a “credit-for-export” tariff. It should also be noted that this particular tariff would apply to all QESSs qualified through criteria (c) or (d) -- in both c and d, the storage system is charged from the grid.

Retail credit to distribution-connected QESSs for the energy they return to the grid has been in effect in Delaware since 2009. In the DE policy framework, utilities provide retail V2G-based EV customers with a credit against their monthly bill in dollars, at the rate per kWh in effect at the time of export. Thus, like transmission-connected systems, they are buying and selling within the same rate scheme. In addition to fairness, this mechanism has the advantage that no new metering nor accounting need be done; the existing utility meter is used for kWh as before and a meter in the charging station is used for PJM reconciliation.

Note, however, that with this mechanism the transmission-connected systems are still at an advantage: they effectively pay wholesale rates for their unavoidable electrical losses, while distribution-connected systems will pay higher retail rates. This represents a small additional payment to the distribution utilities, which we think is acceptable for simplicity of our proposed system.

We recommend that Massachusetts enact similar regulations to permit retail crediting for QESSs qualified through (c) or (d). A more detailed process on how the operational schedule stated in QESS criteria (d) would be implemented is needed.

## Conclusion

UD’s EV R&D Group has extensive experience in this field and has been a leader in researching and implementing V2G technology and policy. We have experience in multiple States and jurisdictions, including New Jersey, Delaware and California, where we have analyzed and, in some cases, designed V2G-related policy. We would be glad to provide any additional discussion and answer questions regarding implementing an operational scheduling process and a credit-for-export tariff structure in Massachusetts.



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