

Electric School Bus V2G REV Demo Project – Q4 2018

The **School Bus V2G** (vehicle to grid) demonstration project is designed to examine the technical and operational viability of using school buses as both a grid resource and transportation asset. Key tests include proving that electric school buses function well for transportation purposes, are reliable as grid assets, and that using them as grid assets does not cause excessive wear and tear on the equipment.

The buses have been performing as transportation since September 2018. Upcoming efforts are focused on building the vehicle to grid hardware for the site and buses.

Project Inception: June 2018
 Project Launch: September 2018
 Project End Date: September 2020
 Budget: \$1.08M
 Q4 2018 Spend: *Filed Confidentially*
 Cumulative Spend: *Filed confidentially (on budget)*



Lessons Learned: Customers (bus operator)

- Success requires embracing operational changes for maintenance staff and drivers
- The buses have succeeded because they have been reliable, with a minimum of fit & finish issues
- The buses required auxiliary heaters for comfortable interior temperatures

Lessons Learned: Market Partner

- Market partners have interest in working with Con Edison to promote V2G technology. It is part of a need to reduce the cost difference between conventional and electric vehicles
- Con Edison is one of the first test markets of V2G and they are uncertain of national demand

Lessons Learned: Utility

- V2G, as designed in this project, can go through existing DG interconnect processes
- Public interest and public policy in support of electric school buses is increasing

Application of Lessons Learned: *Electric school buses can be successfully operated by a vehicle operator that is motivated, committed and sophisticated enough to accept the need for operational changes. The Company intends to better gauge overall market interest by convening a symposium for school bus operators.*

Using a UL-certified off-board inverter makes integrating a bus as a distributed generation asset easier.

Issues Identified: *None at this time.*

Recent Milestones: *a) No vehicle failures from technical causes or otherwise b) 80 days of school bus operations*

Upcoming Milestones: *Major V2G integration, including on site installation of charging stations, software design, and integration of V2G controls into the vehicle*