

Committee: Finance

Testimony on: SB0948 Public Utilities - Electric School Bus Pilot Program

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Position: Favorable

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Testimony on the Benefits of Electric School Bus Utilization of Vehicle to Grid (V2G) Technology

Many schools districts all over the country — urban, suburban, and rural — have been using electric school buses with great success. New electric school buses are capable of traveling more than 150 miles on a single charge, much farther than a typical school bus route. They operate efficiently in inclement weather and can handle the roughest terrain.

A particular virtue of electric school buses is that they contain very large batteries, up to 11 or 12 times the size of electric car batteries. As explained below, these mobile batteries would be very valuable to Maryland's electricity system and to schools and other buildings that can take advantage of the enormous amounts of power stored in electric bus batteries by using technologies called "vehicle-to-grid" (V2G), "vehicle-to-building" (V2B), and sometimes "vehicle-to-everything" (V2X).

These technologies allow for bidirectional power flow, meaning that vehicles can discharge power back to the grid or a building when they are plugged in, providing demand response services, participating in energy or capacity markets, or even serving external load sources, such as buildings. The grid flexibility offered by V2G will become increasingly important as the share of intermittent renewable energy sources on the grid grows.

The grid balancing provided by vehicle-to-grid technology is a valuable asset to electric utilities, and several utility companies, including Dominion Energy in Virginia, Portland General Electric in Oregon, National Grid in Massachusetts, and Con Edison in New York, have launched successful programs to help school districts adopt electric buses. As is the case with the Electric School Bus Pilot Program created by Senate bill 948, these utilities pay for the incremental cost — that is, the difference in cost of purchasing and operating electric school buses as compared to diesel ones.

Although this concept has been around for more than a decade, pilot projects are relatively new, and results of these projects are just starting to come in. One pilot at Beverly Public Schools in Beverly, Massachusetts has demonstrated great results. A single electric school bus equipped with a V2G battery system discharged nearly 3 MWh of electricity stored in the bus to the regional electric grid over the summer. If all the school buses in Maryland were electric and performed like the Beverly school bus, they could potentially provide more than 100 GWh of power to the grid each year. That's equivalent to several days of power from Calvert Cliffs.

In addition to being an important asset for utilities, V2G can be a key component of a resiliency hub or emergency shelter, if that hub or shelter is wired to accept energy from the batteries. Typically this means having a bidirectional charger, something that likely will be commonplace as electric vehicles become more widely adopted. Electric school buses could be used to keep power on in shelters, emergency response centers or other key areas of need during a disaster. When severe weather

warnings are issued, a fleet of electric buses with V2G capability could be deployed to critical locations before transmission lines are powered down and could quickly restore power to critical infrastructure in communities that are blacked out as a result of fire or storm damage to transmission lines.

Many schools in Maryland are designated as emergency shelters. Powerful electric school bus batteries, plugged into highly efficient net-zero schools, can create self-contained emergency shelters capable of operating off the grid for days or even weeks during emergencies.

Ratepayers are likely to see significant cost savings from the deployment of electric school buses. Access to batteries, whenever and wherever they are needed (keep in mind, they are mobile), will make the grid more stable and able to accommodate more intermittent energy and distributed energy resources (DERs), which increase options that drive down electricity costs and have been shown to be inherently cheaper.

As Maryland builds more net-zero energy schools, electric buses can help generate revenue for these schools that can be used to support teacher salaries and other educational purposes. As an example, Maryland's first net-zero energy school, Wilde Lake Middle School, in Columbia, has solar panels that in the first year of operation generated twice as much energy as the school consumed. That excess electricity could be stored in electric bus batteries and sold back to the grid during peak hours, when electricity can be four or five times higher than when the electricity was captured by the batteries. It should also be noted that electric buses are much cheaper to operate, saving 60% or more on fuel and repairs.

Electric school buses and other emerging clean technologies, such as net-zero energy schools, can be an extremely valuable asset not only to Maryland's utilities but to its school districts, its communities, and to the State, as it strives to meet its greenhouse gas reduction goals.

Climate Law & Policy Project urges a favorable vote on Senate bill 948.