

Economic Recovery Transportation Electrification Plan

Electric School Bus V2G Trial

PROGRAM OVERVIEW

The Electric School Bus Vehicle-to-Grid (V2G) Trial is a component of **NV Energy's** <u>Economic Recovery</u> <u>Transportation Electrification Plan</u> (ERTEP).

The objective of this trial is to **demonstrate V2G** integration with electric school buses to mitigate charging impact on system peaks and to understand the co-benefits for the customer and utility.

This program supports the installation of electric bus charging infrastructure for public school districts capable of **providing energy from the bus batteries back to the grid**, i.e. V2G capable.

Charging infrastructure installed at public school districts will be equipped with V2G capabilities to enable NV Energy to **evaluate the potential for electric school bus fleets to discharge energy during on-peak periods and provide back-up power for schools** through distributed charging.



In addition to emission avoidance benefits, insights gained from this program will inform future compensation for grid services, enhance demand response programs, and advance the utility's ability to integrate renewable energy resources into the distribution grid.

NVEnergy

If it is found that electric school **bus batteries can provide significant, reliable grid benefits for all customers**, it will rapidly accelerate the adoption of electric school buses in Nevada. School bus electrification will also benefit public health and **support the reallocation** of public education transportation funding to education due to long-term cost savings from electrification.

SITE PROFILE

In order for NV Energy to **study the benefits of nonstationary storage to grid operation**, the electric charging infrastructure for the V2G trial cannot be served by customer-owned on-site generation.

The V2G trial site profile consists of **10 to 20 single port, vehicle-to-grid 60 kW DC fast chargers (DCFC)**. Based on initial discussions, NV Energy will work with school districts to refine the specific site profile.

ELECTRIC SCHOOL RUS TRIAL SITE PROFILE

Focus Area	Support electric school bus charging and vehicle-to-grid applications			
Charging Ports Per Site	#	Туре	kW	
	10-20	V2G DCFC	60	
Bus Battery Storage	220 kWh electric school bus battery			
Total Estimated Sites	3			

SITE SELECTION

NV Energy will work with the identified school districts listed in the table below to design a V2G trial that **electrifies routes that serve historically underserved communities**.

Historically underserved communities are defined for public schools by Section 12 of Senate Bill 448:

A public school in Nevada:

- In which 75 percent or more of the enrolled pupils in the school are eligible for free or reduced-price lunches pursuant to 42 U.S. C. §§ 1751 et seq.; or
- That participates in universal meal service in high poverty areas pursuant to Section 104 of the Healthy, Hunger-Free Kids Act of 2010, Public Law 111-296

NEVADA POWER	SIERRA PACIFIC POWER
TERRITORY	TERRITORY
Clark County School District: Second largest school district fleet in the U.S. with 1,920 buses in five fleet yards driving 27 million miles per year	Eligible School Districts: Washoe County School District Carson City School District
Site Profile:	Site Profile:
large, up to 20 DCFC ports	small, up to 10 DCFC ports

PROGRAM DESIGN

V2G Electric Vehicle Charging Infrastructure: NV Energy builds, owns and operates (option to transfer ownership)

Electric School Bus Battery Incentive: \$0.60/watt-hour

Electric School Bus Vehicle-to-Grid Trial Tariff:

The credit for discharged energy will be calculated for each hour as the lesser of:

- a) The hourly system incremental generation cost; or
- b) The NV Energy average hourly Load Aggregation Point (LAP) price. The LAP pricing can be found on NV Energy's Open Access Same-Time Information System (OASIS) site.

OWNERSHIP & MAINTENANCE

NV Energy will **provide grid side, make-ready and charging infrastructure** for each site. There is an **option to transfer ownership of customer-side infrastructure** and responsibility for the operations and maintenance to the school districts, if desired. If ownership is transferred, an agreement will be put in place with responsibilities for participating school districts.

In addition, NV Energy will provide **an incentive for the electric school bus battery of \$0.60/watthour** when the bus is delivered to the school district. The electric school bus battery incentive is aligned with NV Energy's current Commercial Large Energy Storage Incentives Program for critical infrastructure. **The operations and maintenance incentive will be \$600 per charger per year for five years**. The incentive will be **paid upon verification of annual performance**.

NV Energy will implement a robust operations and maintenance plan for the infrastructure it owns, including warehousing spare parts to minimize downtime during repairs. This is an important provision to maintain the high level of reliability required as part of this program.

