

## **Additional Resources when Developing a Solicitation for a Turn-Key Electric School Bus Service**

### **Affordability**

There are several grants and programs available to defray the cost of deploying electric school buses. The template Request for Proposal (RFP) indicates that vendors should consider all available sources to reduce the cost to the municipality or school district. This section is for informational purposes, to educate municipalities and school districts on the available grants, incentives, and programs. It is important to note that several of these grants and programs include components that target and provide additional incentives for disadvantaged communities.

### **Electric School Bus Funding Opportunities**

Described below are programs that can be leveraged to reduce the upfront costs to purchase or lease electric school buses. It is important to note that not all programs may be stacked, or utilized to cover a single project concurrently. It is critical to review the specific program criteria to determine the feasibility of stacking program funding.

#### US EPA's Clean School Bus Program

The US EPA's Clean School Bus Program will provide five billion dollars over a period of five years (FY22-26) to replace existing school buses with clean and zero-emission models. Municipalities and school districts who own or lease their own buses are eligible for funding. This program is giving priority to high-need school districts, rural and low-income areas, and tribal schools.

The second funding round of this rebate program has launched with future rounds forthcoming.

- [Click here](#) to access the **EPA Clean School Bus website** to learn more about the program, how to apply, and the benefits of clean school buses.
- [Click here](#) to sign-up for the **Clean School Bus News listserv** to guarantee you receive regular program updates.

#### Massachusetts Offers Rebates for Electric Vehicles (MOR-EV) Trucks Program

The [MOR-EV Trucks Program](#) offers rebates to purchasers/lessors of medium-duty and heavy-duty electric vehicles in the Commonwealth. Vehicles with a sales price of more than \$50,000 and with a gross vehicle weight rating (GVWR) of more than 8,500 pounds made on or after February 16, 2021 qualify for rebates or vouchers. The rebate or voucher amount is determined by the vehicle GVWR and applicable block that the purchaser/lessor qualifies for under the program. Vehicles with a GVWR of greater than 14,000 pounds can also apply for a voucher which reserves a rebate at the current rebate block value. Electric school buses are often substantially heavier than traditional buses as this impacts the anticipated rebate/voucher value.

If it can be demonstrated that the vehicle is registered within, or operates more than 50% of the time within, census block groups that meet the State's Environmental Justice income criteria may also be eligible for a rebate worth 10% more than the current incentive block value.

### U.S. Environmental Protection Agency (EPA) Diesel Emissions Reduction Act (DERA) Grant Program

The Diesel Emissions Reduction Act (DERA) Program is a funding opportunity for public and non-profit entities to replace eligible diesel vehicles and equipment with cleaner diesel or alternative fuels, including zero emission technologies. Opportunities to apply for DERA funding can include grants and/or rebates for electric school buses. The DERA Program is split into a National offering and a State offering, for which states apply for funds and create their own grant programs. Interested parties should check availability and eligibility requirements to determine which program to apply for at any given time. The last MA state program was for electric replacement vehicles/equipment only, and closed in August of 2022. Another opportunity is expected but no date has been provided yet.

- [Click here](#) to access the **US EPA Clean DERA website** to learn more about the federal program and how to apply.
- [Click here](#) to access the **MA Department of Environmental Protection website** to learn more about the state program.

### Accelerating Clean Transportation School Bus (ACT Bus)

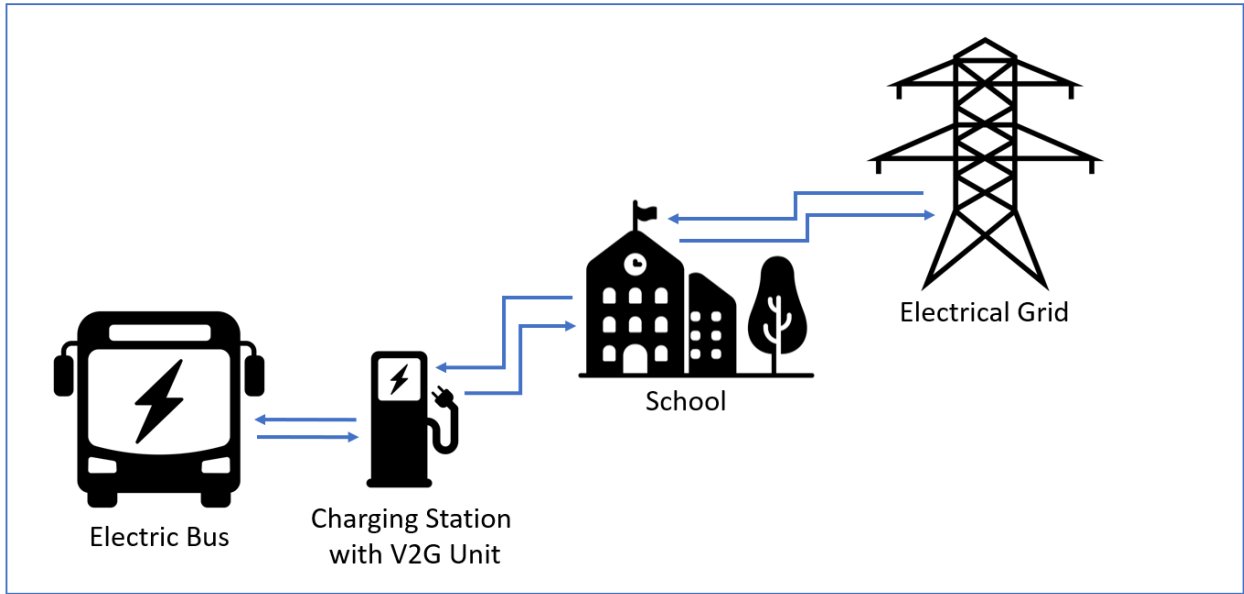
The Massachusetts Clean Energy Center ([MassCEC](#)) currently offers Deployment Technical Assistance and Advisory Services for school districts who want to plan for school bus fleet electrification as part of their [Accelerating Clean Transportation School Bus \(ACT Bus\)](#) program.

### **Vehicle-to-Grid (V2G)**

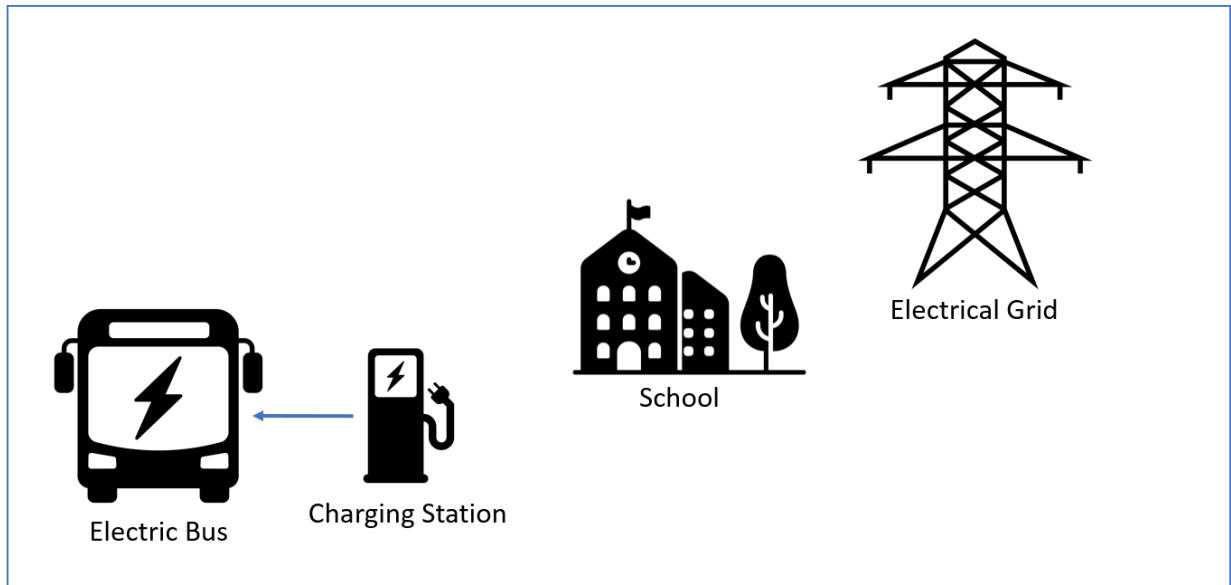
Electric buses and/or the electric vehicle supply equipment they are coupled with can be outfitted with bi-directional charging capabilities (vehicle-to-grid or V2G), allowing power to flow from the bus to a building or electrical grid. This technology enables an electric bus to provide supplemental energy to the electrical grid during peak times when electric prices are higher or potentially serve as a backup power source during emergency outages.

Because their usage patterns are predictable and they typically idle during the midday when energy demand is at its peak, electric school buses are well-suited to participate in a V2G program. Participating in a V2G program might help defray the overall cost of owning an electric school bus. It is important to note that the ability to participate or fully realize the value in a V2G program will depend on how a school district's electric school buses are used. Additionally, higher upfront charger, infrastructure, and interconnection costs associated with a V2G build out may yield it uneconomic depending on the facts and circumstances of potential V2G revenue streams and customer bus usage needs.

Visualization of Vehicle-to-Grid



Visualization without Vehicle-to-Grid



## **Programs that Reduce Electric and Infrastructure Costs**

Described below are programs that can be leveraged to reduce electric and infrastructure costs as they pertain to electric school buses:

### Electric Vehicle Infrastructure Programs

On December 30, 2022, the Massachusetts Department of Public Utilities approved Electric Vehicle Infrastructure Programs proposed by Eversource and National Grid.<sup>1</sup> This approval will provide extensive Make-Ready programs and rebates for charging installation over the next four years for fleet, public, workplace, and residential customers.

### Clean Peak Energy Standard

Clean Peak Energy Standard (CPS) is designed to provide incentives to clean energy technologies that can supply electricity or reduce demand during seasonal peak demand periods.

The CPS program allows for qualified renewable energy generators, energy storage resources, and demand response resources to earn Clean Peak Energy Certificates (CPECs). In turn, the CPS program requires all electricity suppliers to purchase a certain amount of CPECs each year based on a specified percentage of the amount of electricity that they supply. There are no specific EV charger restrictions with regards to CPS participation and can include V2G electric school buses. Additional information about this program is on the [MA Department of Energy Resources Clean Peak Energy Standard website](#).

### Connected Solutions

Connected Solutions is a V2G program offered by Eversource, National Grid, the Cape Light Compact, and Unitil. The program incentivizes customers for decreasing electric use or discharging devices when the grid is at peak demand. Electric school buses participating in these programs can use the vehicle batteries to send power back to the grid during peak times. More information on Connected Solutions is available on the [Mass Save website](#). Although municipal light plants (MLPs) are not currently eligible for Connected Solutions, they do offer their own programs to reduce costs. These programs include incentives for agreeing to avoid electric vehicle charging during potential peak demand hours. Information for some of these MLP programs can be accessed on the [Energy New England \(ENE\)](#)<sup>2</sup> website.

### Demand Response Programs at ISO Level

Demand Response helps electricity customers monitor and manage their energy usage by allowing them to participate in electricity markets to respond to price changes. The program allows one megawatt of Demand Response to be paid on an equal basis with one megawatt of electricity generation. ISO New England offers a variety of programs which all compensate electricity users for reducing consumption when demand or market prices are high and system reliability is at risk. More information on Demand Response Programs is available on the [MA Department of Energy Resources Demand Response and Load Management website](#).

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<sup>1</sup> [Massachusetts Department of Public Utilities Final Order for 21-90, 21-91, and 21-92](#)

<sup>2</sup> Energy New England (ENE) is a municipal light plant cooperative established under Chapter 164, Section 47C of the Massachusetts General Laws. ENE's ownership is made up of light departments in Braintree, Concord, Hingham, Reading, Taunton, and Wellesley.

## **Total Cost of Ownership**

Evaluating the total cost of ownership (TCO) shows that electric school buses are expected to have lower operating, maintenance, and fueling costs, despite higher upfront costs compared to diesel buses. Research also shows anticipated declines in battery costs and expanded driving range, which are expected to make electric school buses a stronger alternative to diesel-powered school buses. Below is a summary with links to access to available resources pertinent to estimating the costs of electric school buses.

### Total Cost of Ownership Estimator

A [Total Cost of Ownership Estimator](#) is available as part of California's HVIP<sup>3</sup> program. After users enter fleet details and financial assumptions, this on-line tool provides estimated cost comparisons between zero- and near-zero emission, medium- and heavy-duty buses and trucks. The Total Cost of Ownership Estimator also shows comparative vehicles of the same sizes with baseline fuels, including gasoline, diesel, and compressed natural gas.

### Total Cost of Ownership Calculator

Dana, a supplier of traditional and electrified systems medium- and heavy-duty commercial vehicles, has a [total cost of ownership calculator for school buses](#). This calculator allows for comparisons between diesel and electric.

### US Department of Energy – Comprehensive Total Cost of Ownership Quantification

An [April 2021 study by the US Department of Energy's Argonne National Laboratory](#)<sup>4</sup> provides a comprehensive analysis of the costs of owning and operating different types of vehicles and how costs vary by powertrain. This study considers vehicle cost and depreciation, financing, fuel costs, insurance costs, maintenance and repair costs, taxes and fees, and other operational costs to formulate a holistic total cost of ownership and operation of multiple different vehicles, including electric school buses.

## **Additional Resources**

The resources identified below provide additional information about school bus electrification:

The [US EPA Charging and Fueling Infrastructure Resources Webpage](#) contains technical assistance video resources on the basics of charging vehicle infrastructure and vehicle availability in addition to other resources.

[US Schools Can Subscribe to an Electric School Bus Fleet at Prices that Beat Diesel](#), Canary Media, March 18, 2022) This article summarizes vendor fleet-as-a-service offerings.

A global research non-profit organization, the World Resources Institute (WRI) offers resources and support to advance the electrification of school buses. Link to the [WRI's Electric School Bus Initiative Webpage](#) and [Technical Assistance Menu](#). Additional resources released by the WRI include:

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<sup>3</sup> HVIP – Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project.

<sup>4</sup> Comprehensive Total Cost of Ownership Quantification for Vehicles with Different Size Classes and Powertrains

### [Power Planner for Electric School Bus Deployment](#)

Resource for school districts to prepare for and engage in discussions with electric utilities about the electrification of school bus fleets.

### [Electric School Bus U.S. Market Study and Buyer's Guide](#)

Developed in June 2022, this guide is intended to serve as a resource primarily for municipalities, school districts, transportation directors, and other school bus operators to provide a better understanding of the state of the electric school bus market and available offerings.

### [Clearinghouse: Electric School Bus Funding and Financing Opportunities](#)

Identifies federal and state opportunities to access funding and financing for electric school buses.

### [Dataset of U.S. School Bus Fleets](#)

This 2022 dataset contains detailed information on the composition of school bus fleets in the United States, including Massachusetts, with information including the municipality/school district that the school bus serves, its model year, fuel type, manufacturer, and ownership model. This dataset can serve a range of environmental and equity use cases, including estimating reductions in greenhouse gas emissions.

This three-part article series by the WRI outlines various ways stakeholders can build on recent federal actions to accelerate the equitable transition to electric school buses.

Part 1 [5 Ways US States Can Get More Electric School Buses on the Road](#) (1/13/22)

Part 2 [How to Help Your Community Fund Electric School Buses in the US](#) (1/26/22)

Part 3 [3 Design Considerations for Electric School Bus Vehicle-to-Grid Programs](#) (2/14/22)

[Electric School Buses and the Grid](#), U.S. PIRG, Environment America, and Frontier Group, Spring 2022  
This report examines how the transition to electric school buses could help expedite the expansion of clean energy by providing a source of reliable battery storage.

The Clean Cities Coalition Network has developed a series of educational webinars and handouts, [Flipping the Switch on Electric School Buses](#), that provides information about the benefits of electric school buses and examples of their use. The series includes topics that address working with utilities, vehicle requirements, charging infrastructure, infrastructure planning, vehicle in-use performance, driver and technician training, and cost factors.