Clean School Bus Webinar for Districts and Utilities

How to Successfully Add Electric School Buses to Your Fleet

Southern Alliance For Clean Energy and EPA Webinar
July 7, 2022
Overview of the Bipartisan Infrastructure Law Clean School Bus Program

Under **Title XI: Clean School Buses and Ferries**, the Bipartisan Infrastructure Law (BIL) provides **$5 billion** over five years (FY22-26) for the replacement of existing school buses with clean school buses and zero-emission school buses.

These new clean school bus replacements will produce either zero or low tailpipe emissions compared to their older diesel predecessors.

School bus upgrades funded under this program will result in cleaner air on the bus, in bus loading areas, and in the communities in which they operate.

The first funding opportunity under this program is the 2022 Clean School Bus Rebates.
$500 Million in Available Funding for 2022 Clean School Bus Rebates

<table>
<thead>
<tr>
<th>Zero Emission Funding Pool:</th>
<th>Clean School Bus Funding Pool:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applications exclusively requesting zero-emission buses</td>
<td>Applications requesting zero-emission, propane, and/or compressed natural gas (CNG) buses</td>
</tr>
</tbody>
</table>

School districts applying directly for funds may only submit one application to replace up to 25 buses.

EPA will not fund multiple applications for bus replacements that will serve the same school district.

The application deadline is August 19, 2022.
School Bus Replacement Funding

The maximum rebate amount per bus is dependent on:

- Bus Fuel Type
- Bus Size
- Whether the school district served by the buses meets one or more prioritization criteria

The table displays maximum funding levels. EPA will not disburse rebate funds in excess of the actual cost of the replacement bus and any costs above the maximum funding level are the sole responsibility of the applicant/awardee.

### Maximum Bus Funding Amount per Replacement School Bus

<table>
<thead>
<tr>
<th>School District Prioritization Status</th>
<th>Replacement Bus Fuel Type and Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ZE – Class 7+</td>
</tr>
<tr>
<td></td>
<td>$375,000</td>
</tr>
<tr>
<td><strong>Buses serving school districts that meet one or more prioritization criteria</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$250,000</td>
</tr>
</tbody>
</table>

[https://www.epa.gov/cleanschoolbus/school-bus-rebates-clean-school-bus-program](https://www.epa.gov/cleanschoolbus/school-bus-rebates-clean-school-bus-program)
Infrastructure Funding

Talk to your utility now if you are interested in zero-emission, electric buses!

This table displays the maximum funding levels per ZE, electric bus. EPA will not disburse rebate funds in excess of the actual infrastructure costs.

<table>
<thead>
<tr>
<th>School District Prioritization Status</th>
<th>ZE, Electric – Class 3+ Infrastructure Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buses serving school districts that meet one or more prioritization criteria</td>
<td>$20,000/bus</td>
</tr>
<tr>
<td>Buses serving other eligible school districts</td>
<td>$13,000/bus</td>
</tr>
</tbody>
</table>
Infrastructure
Funding Restrictions

- EPA funding for infrastructure is limited to the fleet’s side of the meter (as shown on the right side of the diagram).

- All Level 2 charging infrastructure purchased under this program must be EPA ENERGY STAR certified chargers.
  - EPA strongly recommends that all other charging infrastructure (for example DC Fast-Charge) purchased under this program be listed by a Nationally Recognized Testing Laboratory (NRTL).
Check the Systems for Award Management (SAM.gov) to ensure your organization is actively registered as an entity

- An individual user account on SAM.gov is not the same thing as an organization’s entity registration
- Review all SAM.gov entity registration information for accuracy, including bank accounts, addresses, the Unique Entity Identifier (UEI), and Points of Contact
- If your organization has no record of a SAM.gov registration, expired or active, and needs to create a new registration, the simplest entity registration type that can participate in the Clean School Bus Rebates is the “Federal Assistance Awards Only” registration.
- For help with SAM.gov, reach out to the Federal Service Desk at: https://www.fsd.gov

Only individuals with email addresses listed as one of the following Points of Contact (POC) under an active SAM.gov entity registration will have access to create, edit, save, and submit a Clean School Bus Rebate application for that entity:

- Electronic Business POC
- Alternate Electronic Business POC
- Government Business POC
- Alternate Government Business POC

Note: When entering the rebate application, applicants must use the same email as is listed in their POC information in SAM.gov. They will be prompted to sign-in to, or create, a free login.gov account.
Sign up for the Clean School Bus Listserv and continue to check www.epa.gov/cleanschoolbus for updated resources and information on additional webinars.

After reviewing the Program Guide, if you still have questions, please contact cleanschoolbus@epa.gov. Questions will be incorporated in an update to the Q&A document.

The application deadline is August 19, 2022.
NREL and the Joint Office of Energy and Transportation are partnering with the U.S. EPA to offer clean school bus technical assistance to school districts.

Email: CleanSchoolBusTA@nrel.gov

driveelectric.gov/contact
Electric School Bus Education

Flipping the Switch on Electric School Buses

This technical assistance video series is for K-12 schools interested in implementing electric school buses

Watch the videos in order, or pick the topics most interesting or relevant

afdc.energy.gov/electric-school-buses
Successful Electric School Bus Implementation

Vehicle Acquisition

1. Route Analysis
2. Vehicle Specifications/RFP Process
3. Select Bus OEM
4. Test Buses & Train Staff

Infrastructure Development

1. Utility Partner Discussions
2. Plan & Design
3. Construction & Installation
4. Test & Commission

equals

Successful Electric School Bus Implementation
What Should I Consider When Adding an Electric School Bus?

- What is my Range Anxiety?
- How far can I drive?
- What charging equipment is available?
- What charging equipment do I actually need?
- Should I use Managed charging versus unmanaged?
- How long does it take to get the bus and charging station and how long to install?
- Will my charging station work with telematics?
- How long do batteries last?
- What about maintenance?
Energy vs. Power

Energy Needs (kWh)
- Route requirements determined by:
  - Daily vehicle miles traveled
  - Speed
  - Vehicle operational efficiency
  - Auxiliary loads (heat, AC, ...)
  - Environmental impacts
  - Load
  - Terrain

Charger Capabilities (kW)
- Power delivered to vehicle determined by:
  - EVSE type and rating
  - Number of buses
  - On-board charger
  - On-site electrical capacity
  - Dwell time
  - Time to recharge
  - Future plans
## EV Charger = Electric Vehicle Supply Equipment (EVSE)

### AC Level 1 – Portable 120 V

<table>
<thead>
<tr>
<th>EVSE</th>
<th>Features</th>
<th>Chargers/Unit</th>
<th>Cost/Charger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>Non-networked</td>
<td>1</td>
<td>$813</td>
</tr>
<tr>
<td>Level 1</td>
<td>Non-networked</td>
<td>2</td>
<td>$596</td>
</tr>
<tr>
<td>Level 2</td>
<td>Non-networked max 19.2 kW</td>
<td>1</td>
<td>$1,182</td>
</tr>
<tr>
<td>Level 2</td>
<td>Non-networked max 19.2 kW</td>
<td>2</td>
<td>$938</td>
</tr>
<tr>
<td>Level 2</td>
<td>Networked max 19.2 kW</td>
<td>1</td>
<td>$3,127</td>
</tr>
<tr>
<td>Level 2</td>
<td>Networked max 19.2 kW</td>
<td>2</td>
<td>$2,793</td>
</tr>
</tbody>
</table>

### AC Level 2 – 208-240 V

| DCFC          | Networked 50 kW            | 1             | $28,401      |
| DCFC          | Networked 150 kW           | 1             | $75,000      |
| DCFC          | Networked 350 kW           | 1             | $140,000     |

### DC Fast Charging – 50-1,000 V

| DCFC          | Networked 50 kW            | 1             | $28,401      |
| DCFC          | Networked 150 kW           | 1             | $75,000      |
| DCFC          | Networked 350 kW           | 1             | $140,000    |
Managed Charging Solutions

How to mitigate equipment upgrades and reduce the cost to charge

• **Equipment upgrade mitigation**
  - Set a power ceiling for site-wide EVSE and coordinate charging to reduce equipment upgrades.

• **Reduce electricity costs**
  - Shift EV charging to periods with lower TOU rates
  - Coordinate EV charging loads to reduce peak demand
Working with your Utility Partner

**Preparation**
- Number of Vehicles
- Daily Energy Needs
- Number of EV Chargers
- Current Infrastructure

**Introduction**
- Service Representative
- Create Partnership
- Making Connections

**Discussion**
- Site Drawings
- Vehicle Acquisition Plans
- Equipment Limitations
- Utility Upgrades/Interconnection
- Plan & Design
Implementation Plan for BEB Infrastructure

**Vehicles**
Choose BEB model for fleet applications
Range, Capacity, Charging

**EVSE**
Choose EVSE type and quantity
SAE AC Level 2
SAE CCS/CHAdeMO

**Utility**
Contact utility rep regarding new load
Grid impacts
Transformer/Wiring

**Analysis**
Determine necessary upgrades
Service Panel
Circuit Breakers

**Construction**
Install new infrastructure
Breakers
Conduit/conductors EVSE
Site Layout

• **Determine locations of:**
  – Parking, panel, interconnection

• **Minimize panel to EVSE distance:**
  – Shorter wiring and conduit run
  – Reduce trenching costs (~$100/ft)

• **Consider future expansion:**
  – Install additional wiring/conduit
  – Stub-outs for future expansion
  – Minimize construction costs over time
EVSE Installation Costs

• Installation costs are primarily dependent on EVSE type and power.
• L2 pedestal units are common for fleets with a long dwell (8+ hours).
• Installation costs per port decrease as EVSE installations per site increase.

<table>
<thead>
<tr>
<th></th>
<th>1 Port/Site</th>
<th>2 Port/Site</th>
<th>3-5 Port/Site</th>
<th>6+ Port/Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor</td>
<td>$1,544</td>
<td>$1,827</td>
<td>$1,647</td>
<td>$1,316</td>
</tr>
<tr>
<td>Materials</td>
<td>$1,112</td>
<td>$1,039</td>
<td>$1,272</td>
<td>$874</td>
</tr>
<tr>
<td>Permit</td>
<td>$82</td>
<td>$62</td>
<td>$59</td>
<td>$38</td>
</tr>
<tr>
<td>Tax</td>
<td>$96</td>
<td>$89</td>
<td>$110</td>
<td>$75</td>
</tr>
<tr>
<td>Total</td>
<td>$2,836</td>
<td>$3,020</td>
<td>$3,090</td>
<td>$2,305</td>
</tr>
</tbody>
</table>
2022 Clean School Bus Rebate Program

Thank you!

Sign up for the Clean School Bus Listserv and continue to check www.epa.gov/cleanschoolbus for latest program updates.

Visit STRIDECollaborative.org for electric School Bus Webinars and regional information

Region 4 Contacts:
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Submit feedback to cleanschoolbus@epa.gov. Please hold off on submitting questions until the Program Guide is published.
Questions?