# ELECTRIC SCHOOL BUS BUYERS' GUIDE


SIERRA CLUB
NEW JERSEY CHAPTER

New Jersey Clean Cities

# NEW JERSEY ELECTRIC SCHOOL BUS BUYERS' GUIDE

## DISCLAIMER

This document was prepared by the Transportation Committee of the New Jersey Chapter of the Sierra Club and the New Jersey Clean Cities Coalition. Our organizations are dedicated to environmental stewardship and sustainable transportation solutions. The Sierra Club New Jersey Chapter & New Jersey Clean Cities Coalition neither endorse nor recommend any specific products, manufacturers, dealers, lessors, or purchase arrangements. The included lists of companies are provided for informational purposes only. The New Jersey Chapter of the Sierra Club and New Jersey Clean Cities Coalition are solely responsible for the content of this document. While we have attempted to confirm and verify all information, school districts should contact the appropriate companies and sales reps for current updates to their offerings.

# NEW JERSEY ELECTRIC SCHOOL BUS

# BUYERS' GUIDE

Embarking on the journey toward a cleaner, more sustainable future is a collective effort that requires vision, commitment, and collaboration. We are thrilled to present the Electric School Bus Buyers' Guide, and it is with immense gratitude that we extend our heartfelt thanks to the dedicated school districts who have chosen to embark on this transformative journey with us.

As you navigate through the pages of this guide, we hope you will find valuable insights, useful tools, and actionable information for where, when, and how to purchase electric school buses in New Jersey. From reduced emissions to long-term cost savings, the advantages are numerous and far-reaching.

We understand that this transition may come with its challenges, but we are here to support you. Our shared goal is to make this transition successful, ensuring that you reap the full benefits of this forward-thinking decision. Your decision to embrace electric school buses is not only a testament to your commitment to the well-being of your students, but also a powerful step toward a greener tomorrow.

SIERRA CLUB
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# ABOUT
## OUR ORGANIZATIONS

## SIERRA CLUB - NEW JERSEY CHAPTER

The NJ Chapter promotes awareness and action in local and statewide conservation and environmental justice issues and sponsors outings for adults and youth to promote awareness of our environment. As a grassroots advocacy and lobbying organization, the New Jersey Chapter also engages in political activity, working to elect environmental champions and pass legislation to meet the demands of the climate emergency.

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sierraclub.org/new-jersey/electric-school-bus-campaign

## NEW JERSEY CLEAN CITIES COALITION

NJ Clean Cities is an independent nonprofit dedicated to the deployment of advanced vehicles using clean, domestic fuels. The coalition is a part of the Mid-Atlantic Electric School Bus Experience Project (MEEP) which seeks to encourage the use of electric bus fleets in school districts. The project provides school districts, school bus contractors and their stakeholders with electric school bus education, ride and drive opportunities, fleet demonstrations, route performance analysis, and other tools.

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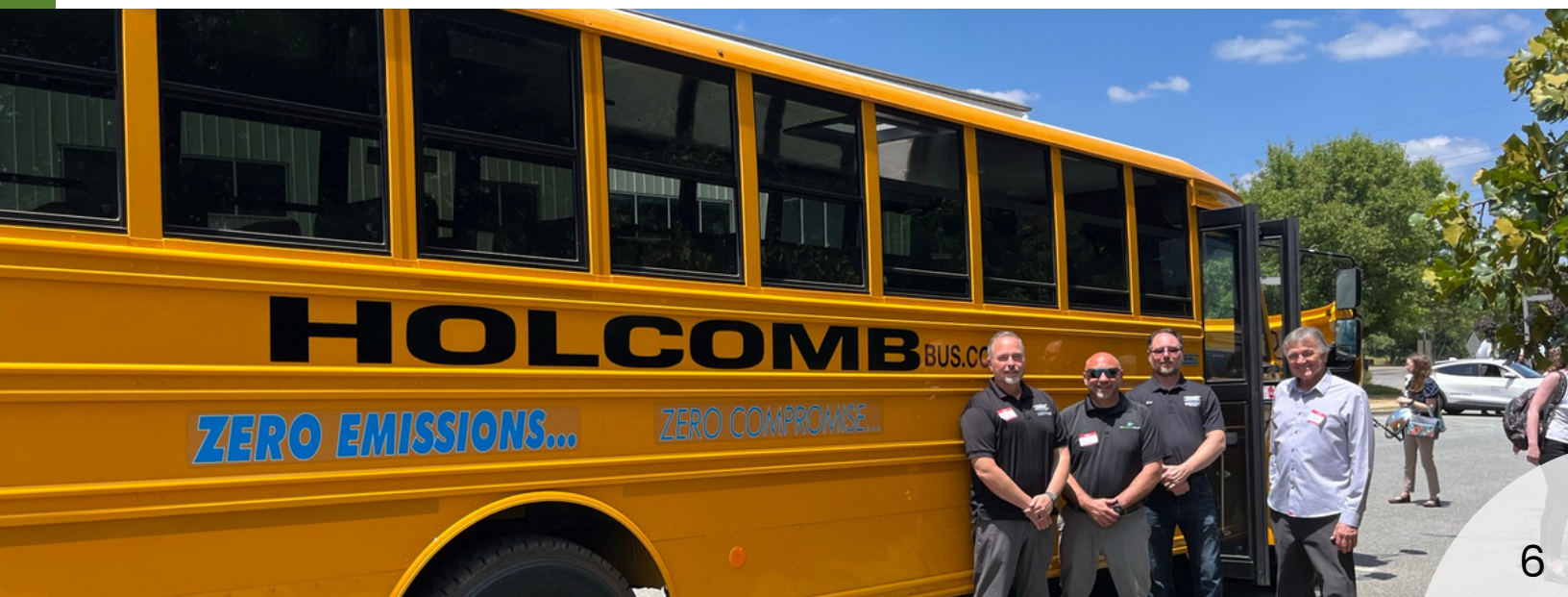
# NEW JERSEY ELECTRIC SCHOOL BUS BUYERS' GUIDE

## 1. ACQUIRING THE BUS

There are numerous ways to acquire electric school buses for school districts that operate their own school bus fleets.

Options include purchasing outright, financing a lease over a number of years (typically 5 with an option to buy or sell at the end of the financing period), or turnkey subscription services. Districts can negotiate various leasing or financing arrangements by working with their dealers.

When acquiring an electric school bus, other costs to consider are the purchase, installation, and ongoing maintenance of charging stations and charge management systems, along with the hiring of an electrical contractor to install the charging stations and connect them to the utility.

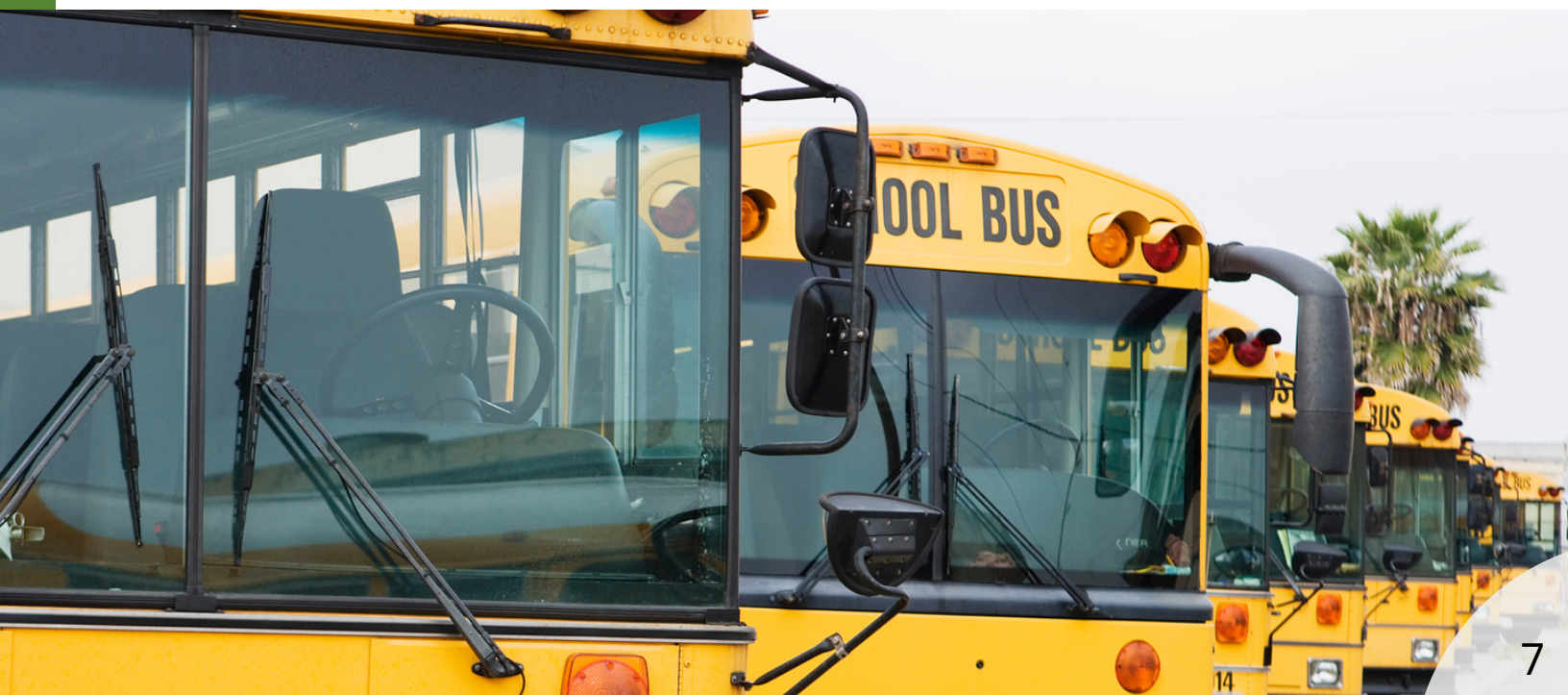


# PURCHASE VS. LEASE

Electric school buses can be procured outright using a combination of district funds, along with possible federal, state, and utility grant and incentive funding sources.

Buses may be purchased directly by the district from local dealer or through contracts negotiated by buying cooperatives such as the Hunterdon County Educational Services Commission (HCESC) and the Educational Service Commission of NJ (ESCNJ). Buses may also be purchased through SourceWell, a national educational purchasing co-op.

New Jersey also permits school districts to enter into lease agreements to purchase school buses. Although the law [N.J.A.C. 18A:19A-42 (f)] allows leases of up to 10 years, many districts find it cost effective to negotiate 5-year leases, selling the bus at the end of the lease period. One of the rationales for this is to avoid the higher costs of maintaining older school buses. However, since the benefits of electric school buses include drastically lower maintenance and operating costs, it may now be more beneficial to school districts to enter into longer term, 10-year leases for electric school buses.



Buying through one of the established contracts is easier and less time consuming, in that the district does not need to go through a separate bid process. However, this limits the district to a single bus manufacturer, and prices for buses purchased through the buying cooperatives may be higher than the district can obtain in direct negotiation with the manufacturer and dealer. For example, HCESC's offerings provide for a 25% discount from list, but offer a bulk purchase discount of only $100/bus when 2 or more electric school buses are purchased.

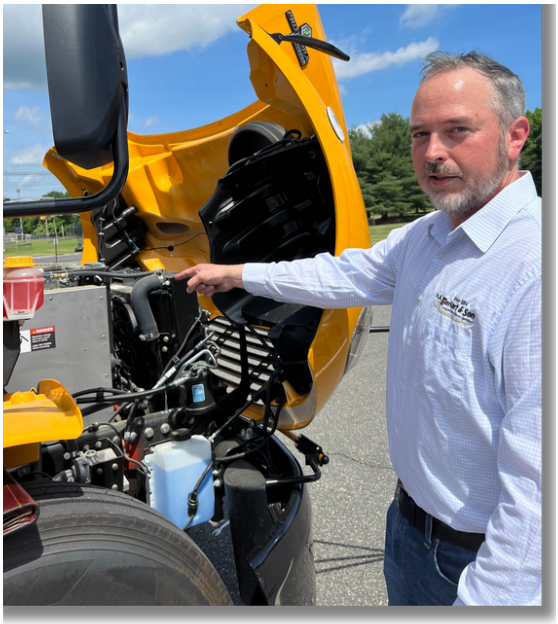
The alternative, putting out a bid for a generic bus, may allow for price competition between different manufacturers, but obviously it is more time consuming and resource intensive for the district.

In either case, the district is advised to bundle the buses, charging stations, and charge management system as a package. This will ensure that the 3 components are compatible with each other and reduces the potential for finger pointing between different vendors if problems arise later on.

The district should also rely on the dealer to recommend an electrical contractor who has the right technical expertise and experience with installing the charging stations and high-voltage utility hookups. The contractor will work with the local utility to bring the necessary high-voltage service to your bus yard and help determine how to do so in a way that facilitates future expansion at the lowest cost.

The manufacturer or dealer should also provide all necessary training for bus operators, maintainers, maintenance supervisors, and local emergency response personnel.

As with any large purchase, a maintenance contract, including a spare parts inventory, is advised for both the buses and charging equipment.



# SUBSCRIPTION SERVICES

An alternative to outright purchase or lease is a subscription service. There are firms that provide turnkey subscription deals. For example, Montgomery County in Maryland recently announced a 10-year deal to acquire 326 electric school buses using this model.

In these arrangements, a private company will design the system, purchase the vehicles, hire an electrical subcontractor, interface with the utility company, purchase and install the charging stations, and complete all the necessary hookups, training, and software configuration. Regularly scheduled and routine maintenance are also included in these contracts.

At least one company will even contract back with the school district for routine and scheduled maintenance work, ensuring that existing maintenance staff continue to be employed by the district. School bus drivers remain district employees, and the district continues to be solely responsible for scheduling transportation services.

Prices for the subscription service are set so that the annual cost is less than the district's current per bus total cost of ownership.

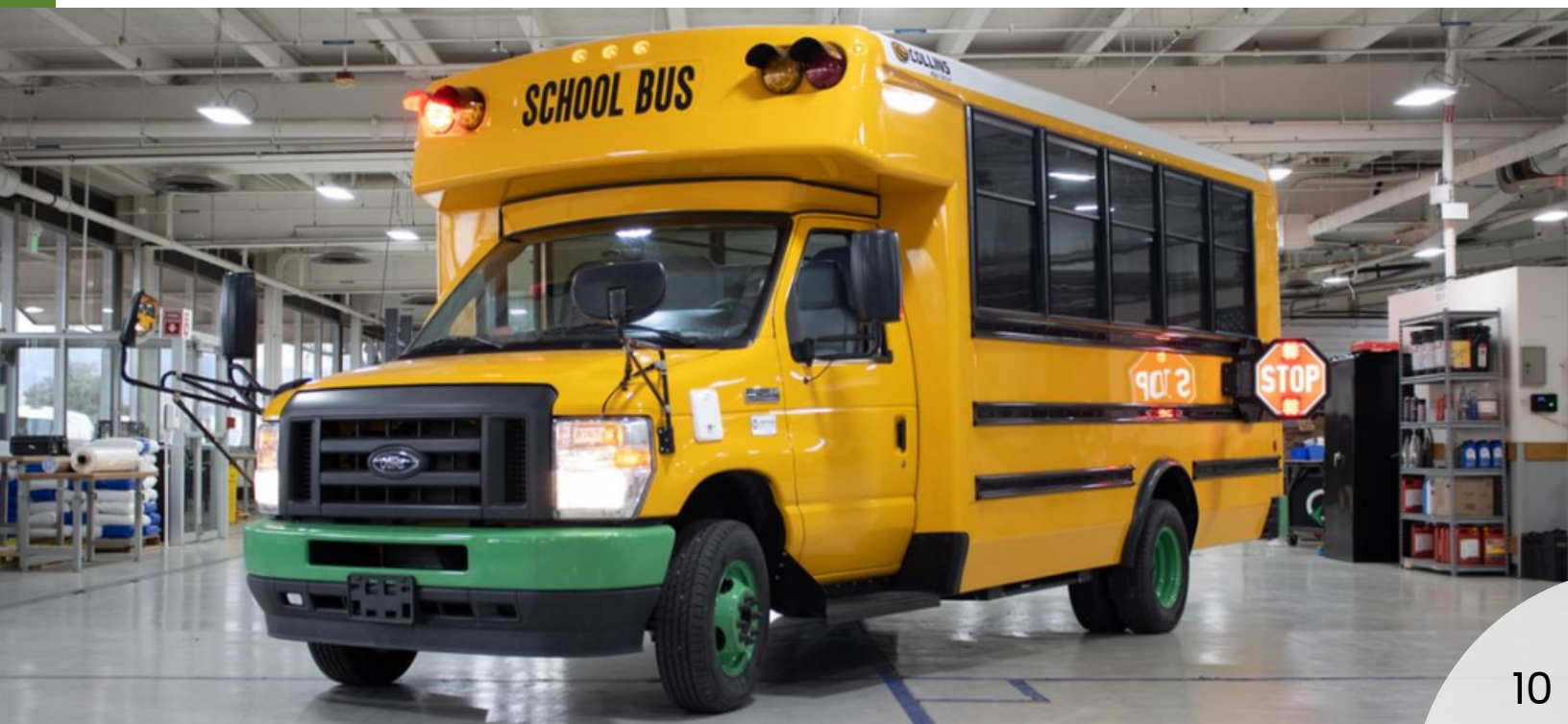
Liability insurance may remain the responsibility of the district; however, this should be reviewed and confirmed with the provider.

Each of the companies providing these services has their own billing procedure; these are described later in this eBook.

For contracts that involve replacing a large number of buses, deployment will typically be phased in over the 10-year term of the contract.

Districts need to do a thorough evaluation of the life-cycle costs and benefits of entering into a turnkey subscription deal compared with outright purchase or traditional lease, paying particular attention to what happens at the end of the contract term. If the district does not renew the contract, the ownership of all vehicles, charging stations, and energy management systems remains with the lessor. The district should ensure that the contract clearly defines the options for continuing operations at the end of the contract term.

**NOTE: There has been some discussion as to whether this option is permitted under current New Jersey public procurement law. ChargEVC, a nonprofit advocacy group for vehicle electrification, of which both the Sierra Club and NJ Clean Cities are members, is working with various legislators to clarify this question. The organizations will monitor this development and help publicize if and when this option becomes available to NJ school districts.**



# REPOWERING (DIESEL TO ELECTRIC CONVERSIONS)

Districts that have a relatively new fleet and do not feel that their fleet is ready to be replaced may have another option. Diesel buses can be converted to battery electric buses. The retrofitting process typically costs less than purchasing an entirely new vehicle, making it a financially attractive option. Additionally, repowering extends the useful life of the existing bus chassis, while minimizing the environmental impact of manufacturing a new vehicle.

The cost to repower an electric school bus depends on several factors, including the bus selected for repower, who will perform the upfit, and where the work will be completed. Ballpark costs for a conversion completed at a third party provider's facilities may be in the range of $150,000. The argument has been made that the total cost of purchasing a new diesel bus (low $100,000s) and immediately converting it to electric could be significantly cheaper than buying a new electric bus.

**NOTE: Currently, neither the EPA Clean School Bus Program nor the NJ RGGI programs will consider funding repowers. However, repowers are an eligible funding option under the EPA's Diesel Emissions Reduction Act (DERA). See Chapter 6 for more details.**


There are at least 2 companies, 1 based in California and the other on Long Island, that currently offer this service. Both companies have kits that allow conversions to be done on-site by qualified mechanics. They also both claim comparable or even better mileage per charge than original equipment manufactures.

# BUS MANUFACTURERS AND DEALERS

## BLUE BIRD

Blue Bird/Micro Bird Electric buses are offered in commercial/shuttle configurations. Can be charged on Level 2 or Level 3 AC or DC Fast Charge, 196kWh battery DCFC only. The company offers assistance with in state and federal funding /grant guidance and submittals.

**Dealer Contact:**
**Richard Weber Jr.**
EV Truck & Commercial Bus Sales
Hoover Truck & Bus Centers

r.weberjr@hoovertruckcenters.com
908-202-2317
blue-bird.com

149 Gold Mine Road
Flanders, NJ 07836
973-347-4210

1784 US Route 9
Toms River, NJ 08755
732-341-2128

4313 Rote 130 South,
Edgewater Park, N.J. 08010
856-773-4600

## THOMAS BUILT BUSES

Thomas Built Buses offers buses for purchase through the Hunterdon County Educational Services Commission, Educational Services Commission of NJ, or SourceWell co-ops. Thomas Built offers numerous leasing and financing options, including a subscription service through Highland Electric Fleets. All Thomas Built buses require DC fast charging stations.

**Dealer Contact:**
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brandon@hadehart.com
908-509-4287

H.A. DeHart & Sons, Inc.
311 Crown Point Road
Thorofare, NJ 08086

856-845-2800
thomasbusnj.com

## LIGHTNING eMOTORS

Lightning eMotors builds Type A electric battery school buses and electric shuttle buses. The buses are built in partnership with Collins Bus Corporation using GMC Savana 4500/Chevrolet Express 400 24 seat capacity chassis. The company supports both Level 2 AC and DCFC chargers. Battery capacity is 120 Kwh and charge times are 7-8 hours (Level 2) and 1.5-2 hours (DCFC.)

**Dealer Contact:**
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201-421-9590

Lightning eMotors.
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Loveland, CO 80537

970-744-4047
lightningemotors.com

# LION ELECTRIC BUSES

Lion partners with a third-party finance group to provide lease and finance options. The company also has a grant team to assist customers with identifying and applying for grant funding opportunities, and it will help design and configure your charging infrastructure.

**Dealer Contact:**
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Sales Manager

sales@hktruck.com

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South Plainfield, NJ 07080

908-754-3330

hktruck.com/escnj-lion-electric

# MODEL 1

Model 1 offers Type A, C, and D school buses, activity buses, school vans, seating configurations, and accessibility options. And for even more flexibility, the Model 1 Rental and Lease Program is available on all new and used school bus inventory.

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amayro@model1.com

201-776-1082

Model 1
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Carlstadt, NJ 07072

201-507-8500x902

model1.com

# IC BUSES

IC buses may be purchased outright through the Educational Services Commission of NJ, or through a lease-to-buy arrangement from the dealers. IC provides federal and state grant preparation assistance through their dealers.

**North Jersey (north & east of Mercer and Monmouth Counties)**

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Sales Manager

emarello@Allegiancetrucks.com

201-481-0105

AT New York City LLC
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Newark NJ 07105

732-495-0440

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1315 Route 38, PO Box 160
Mount Holly, NJ 08060

609-267-0763

wolfington.com

# SUBSCRIPTION SERVICES

## HIGHLAND ELECTRIC FLEETS

Highland Energy Fleets offers a "subscription service" in which they will provide a total package of buses, charging stations, and EMS and manage the integration with the utility company on a per bus annual charge. The usual contract term is 10 years. Highland retains ownership of all equipment at the end of the lease period unless other arrangements are negotiated. Monthly payments are based on a combination of the number of buses in service and the mileage travelled. Highland is manufacturer agnostic and specializes in V2G applications.

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Mid Atlantic Regional Business Manager

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200 Cummins Center, Suite 273-D
Beverly, MA 01915

978-288-1105

highlandfleets.com

## INCHARGE ENERGY

InCharge Energy provides a similar service specifically in association with Blue Bird Corporation. Blue Bird will survey your property and design, purchase, install and configure your electric bus fleet. Depending on how the contract is structured, the payments are based on either on vehicle miles traveled or KwH usage within the billing period. The typical time frame is 10 years. At the end, the district or contract bus company can buy back the equipment for continued use or extend the contract.

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EV Truck &Commercial Bus Sales

r.weberjr@hoovertruckcenters.com

908-202-2317

Hoover Truck & Bus Centers
149 Gold Mine Road
Flanders, NJ 07836

973-347-4210

inchargeus.com/industries

# REPOWERS

## SEA ELECTRIC

SEA Electric has successfully converted IC and Blue Bird school buses and are working with Thomas Built. They claim that their proprietary software achieves a 1.0-1.2 Kwh/mile efficiency for increased mileage range. Buses can be converted using a DIY kit. Estimated costs are about $135,000 and they offer an 8 year, 150,000 mile warranty on the battery and a 5-year, 100,000 mile warranty on the motor.

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VP of Sales

billw@sea-electric.com

310-601-6751

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Torrance, CA 90503

424-376-3660

sea-electric.com

## UNIQUE ELECTRIC SOLUTIONS

UES has been converting class 4-7 trucks from diesel to electric and has recently begun converting type A-D school buses. Their system can be tailored to achieve a vehicle range of up to 180 miles, with a battery pack rated at 150 usable Kwh and a theoretical efficiency of 1.5 – 1.8 kwh/mile. The cost of the repower is about $160,000. Conversions can be done at their facilities or in the field with qualified local labor and a kit provided by the company. The company offers a 5-year warranty for the system, and also offers a subscription service for the battery pack thereby lowering the upfront cost of conversion. Only buses model year 2010 or newer will be converted.

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# 2. VEHICLE SPECIFICATIONS

## BUS SIZE AND SEATING CAPACITY

School buses come in a variety of shapes and sizes, which are classified by letter designation — A, B, C, or D.

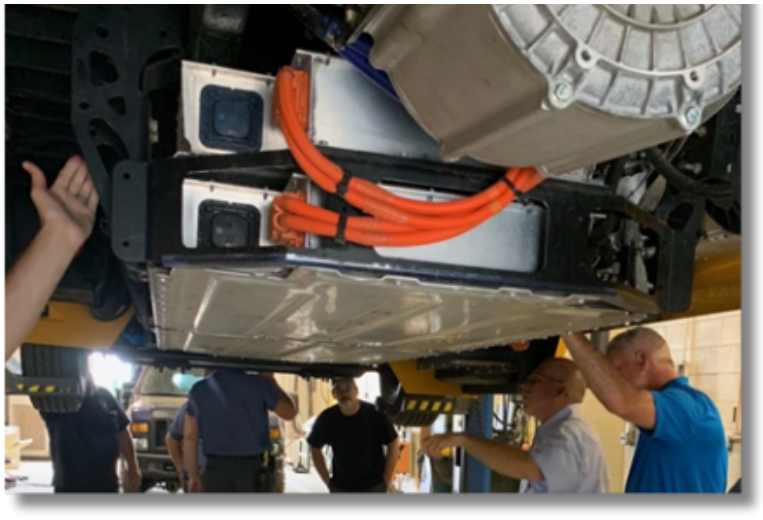
Class A and B buses are smaller buses with a seating capacity of 10 – 24 passengers. Class C and D buses typically seat 54 passengers, and differ in design in that Class C buses are built with their engine in front of the bus, while Class D buses have a flat front similar to an NJ Transit bus.

## MATCHING MILEAGE REQUIREMENTS AND BATTERY CAPACITY

Battery capacity is the single biggest variable affecting the initial cost of an electric school bus. Therefore, it is important to match the battery capacity specified when purchasing or leasing a vehicle to the expected route mileage within a district.

Nationally, the average driving distance per shift for a typical school bus is about 32 miles, for a total of about 73 miles (and 5 hours of driving) per day (NREL). ESBs currently on the market are all more than capable of serving most school districts' short to medium-length routes.

Districts need to inventory their routes and the maximum mileage for each route. Battery capacity can then be matched to the required mileage to minimize costs. Focusing on shorter routes initially may allow a district to deploy more cost-effective buses with smaller battery packs to gain more insight into the districts, routes and capacity needs.



The example below is based on a Class C Thomas Built bus, which uses a battery pack produced by Proterra Technology:

> The largest batteries now available have a maximum battery capacity in the range of 226 kWh. However, the manufacturer will also specify a "usable capacity," which is the recommended limit above which the battery should not be drained. For Proterra, the recommended maximum usable energy for its 226 Kwh battery is 199 Kwh.
>
> The other variable in calculating theoretical range is the vehicle efficiency, expressed in Kwh/mile. This will vary based on the manufacturer, bus size, and other factors. Theoretical mileage is then calculated by dividing usable capacity by efficiency.
>
> For a Thomas Built bus with a 199 Kwh usable capacity and a 1.44 Kwh/mile efficiency, the theoretical range is 199 Kwh/1.44 Kwh/mile, or 138 miles per charge.

Smaller battery packs can be specified if the daily morning and afternoon round-trip mileage is less than 90 miles. Similarly, Class A and B buses should have a higher Kwh/mile efficiency, which will also allow a smaller battery pack.

However, as with gas-powered vehicles, actual mileage will vary from calculated miles/charge based on weather conditions, how often the vehicle starts and stops, whether the road is hilly or flat, the heating or air conditioning load, and other similar factors. Driver training is also an important tool to improve energy efficiency.

Monitoring real time Kwh/mile usage is critical to maximizing the vehicle's range. New Jersey's first electric school buses hit the road in the fall of 2022, so there is limited in-state experience with which to compare actual versus theoretical mileage. Focusing on your shortest, most predicable routes first, and investing in driver training may offer the best path to successfully integrating ESBs into your service.

## HEATING & COOLING SYSTEMS

Options include heat pumps, electric resistance heaters, and diesel powered auxiliary heaters. The choice of these systems may affect mileage range and energy use. Your dealer can discuss what options the manufacturer offers and which would be best for your environment.

With electric HVAC systems, expect that bus mileage range may decrease by 15% during summer months due to air conditioning requirements and by up to 30% or more on the very coldest days due to heating requirements. Optional fuel-fired auxiliary heaters can improve range. But, electric heat pumps are recommended as the most efficient heating option.

## TELEMATICS

One innovation that is now mostly standard on electric school buses is what is referred to as "telematics." These are diagnostic systems that display and report operating data in real time for use in analyzing operating problems and tracking remaining battery power. Some buses are outfitted with internet access via SIM cards that can provide the owner, operator, and manufacturer with real-time vital statistics such as average kWh/mile, average mileage per full charge, remaining battery charge, mean distance between failure (MDBF), and equipment status.

Charging stations may also be configured to download this data while the vehicle is being charged and require a cable connection or secure Wi-Fi to the facility's local area network.

The manufacturer will also provide the software needed to receive, view, and report on this information.

The NJ Department of Environmental Protection now requires telematics in all vehicles funded through their grants.

# 3. CHARGING STATIONS & TECHNOLOGY

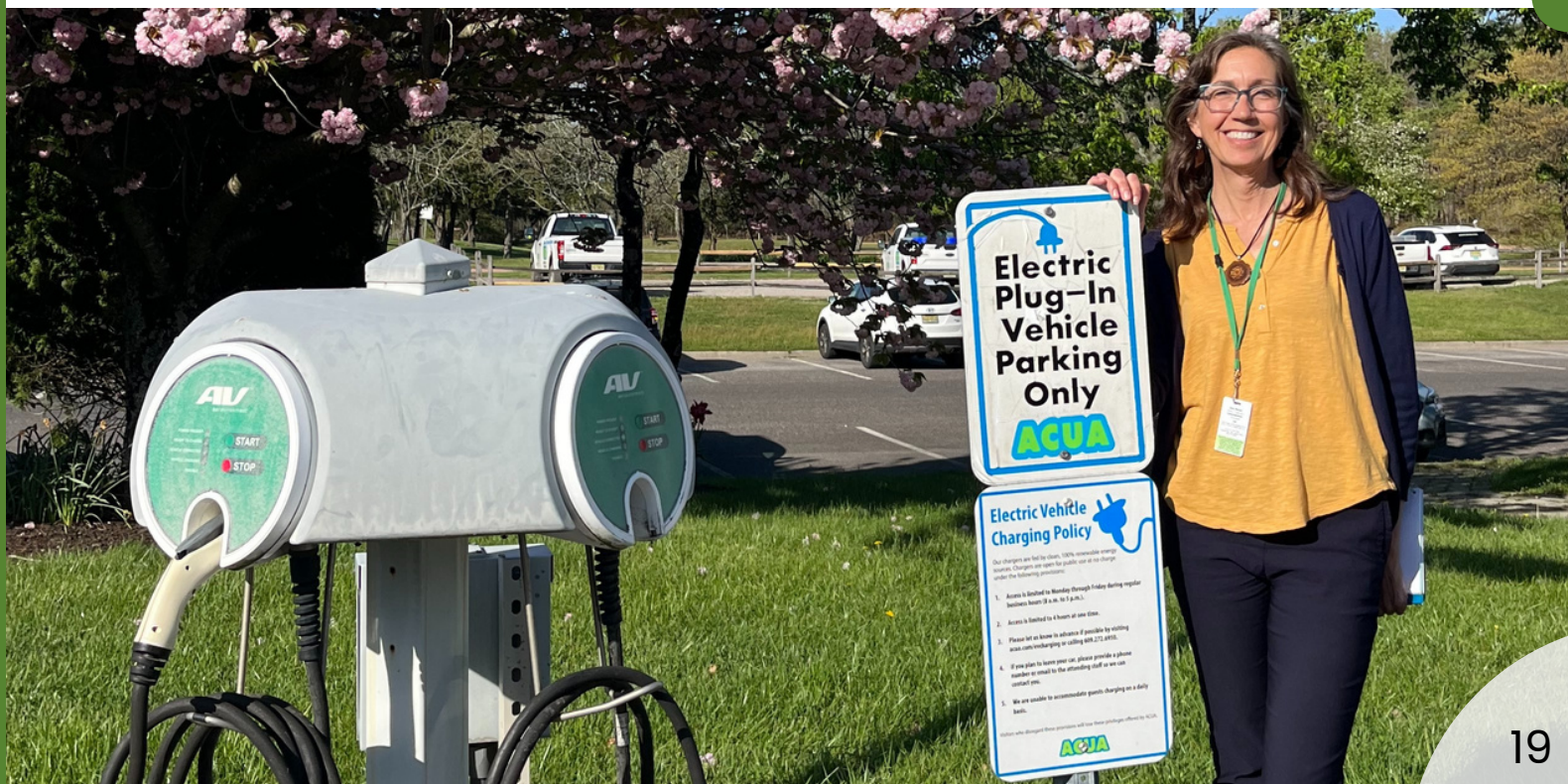
## CHARGING STATIONS

Charging stations range from slower charging stations using standard AC current to fast charging stations that use DC current.

Options for fleet charging include:

- **Single, stand alone chargers**
- **Power control system** that can pair with up to 4 charging dispensers
- **Overhead pantograph systems** that are suitable for a garage environment housing a large bus fleet

Chargers are also classified by how much power they can deliver in a set period of time. You might be familiar with the classification of chargers used for passenger vehicles.



**Level 1** chargers use a common 120-volt household outlet. Level 1 is the slowest way to charge an EV. This option will probably not require any increased capacity delivered by the utility company, and is therefore the easiest to implement if you are charging one or two buses. Due to the long time required to fully charge a bus, this is usually not the appropriate charging system for a school bus, but could be used in an emergency.

**Level 2** chargers require 208-240 volt connections and can deliver up to 80 amps of power. Depending on the existing service to the facility, this may require either an added 208 volt service on your electrical panel or additional capacity on the part of the utility, particularly if multiple charging units are required. Level 2 chargers can cost in the neighborhood of $2,000 -$5,000 for equipment and $1,000–$10,000 or more for installation.

**Level 3** chargers are referred to as **DCFC** (Direct Current Fast Chargers). These require a 3-phase 400-900 volt connection, and could require additional capacity from your local utility. These chargers are therefore the most expensive, and can run between $10,000-$40,000 per charger for equipment and from $4,000 to over $50,000 for installation, depending on the complexity of the installation.

## COMMUNICATION REQUIREMENTS

A robust internet connection is imperative for efficient electric school bus charging stations. It enables real-time monitoring of charging stations and facilitates remote diagnostics and troubleshooting. This connectivity allows operators to track energy usage patterns, optimize charging schedules, and remotely initiate software updates for enhanced performance and security. Moreover, it enables seamless integration with central management systems, grid operators, and third-party platforms, ensuring interoperability and smooth data exchange. Reliable and high-speed internet connectivity forms the backbone of charging stations, enabling them to deliver a seamless and user-friendly experience for school districts.

## RECHARGE TIME

Chargers are rated in kilowatts. To determine how long it will take to fully recharge an electric bus's battery pack, divide the usable battery capacity by the charger power rating:

**Usable Battery kWh / Charger kw = Time**

While there are other factors to consider, here's a very simple example:

A 200 kWh usable battery capacity being charged by a 60 kw DCFC will take 3 hours and 20 minutes to charge: ***200 kWh/60kw = 3.33 hours***

## CHARGE MANAGEMENT SYSTEMS

Charge management systems are a critical component of the electric school bus procurement process for efficient operations. This software manages the charging process to ensure that buses are charged at the appropriate times to minimize demand and peak power surcharges, thus holding down electricity costs. Charging systems can also manage vehicle-to-grid (V2G) or vehicle-to-building (V2B) systems, in which excess power stored in the bus battery can be resold to the utility company or used to power air conditioning or lighting systems in the school buildings.

Charge management systems are typically third-party products in addition to the chargers themselves that the manufacturer or lessor may bundle with the charging stations to ensure compatibility and functionality. Anticipate monthly or yearly subscriptions as part of the service.

## V2G AND V2B EXPLAINED

V2G and V2B are two ways in which stored electricity in the bus's battery can be used to obtain additional revenue or to reduce the use of utility electricity in school buildings.

In these scenarios, the electric charging station is configured to allow bi-directional flow of power to and from the vehicle and either the utility grid (V2G) or the school campus (V2B).

If the school district is interested in using the school bus batteries as storage devices to sell power back to the utility company or to provide power to the school buildings during peak load periods, additional equipment, specialized charging stations, and software are required to facilitate and monitor bi-directional power flow.

Buses that are fully charged and sitting idle in the bus yard can be programmed to feed their stored energy back to the utility grid, in which case the school district earns revenue from the utility or sees a reduced payment to the subscription company. In a V2B arrangement, the energy is fed back to the district's building(s) to help run air conditioning, lighting, and other electrical loads, thereby reducing the amount of electricity purchased from the local utility company. The buses' batteries are then recharged at off-peak rates prior to being placed into route service.

If the district intends to employ V2G or V2B, this should be specified when the buses are initially purchased, as both the charging stations and the charging port on the bus need to be designed for bidirectional power flow. There will likely be additional requirements by the utility that should also be confirmed.

There is not yet an established rate structure for utility buyback of power from a V2G system, and no such systems have been installed in New Jersey.

# CHARGING & TECHNOLOGY CONSULTANTS

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nuvve.com

# REI-V2G

REIV2G is a systems integrator, bringing together renewable energy, EV chargers, E buses and grid expertise to plan, assemble and manage the necessary team of teams (financial, grant/rebate, vehicle, charging, utility, grid, communications, reporting, measurement and Verification) to make fleet electrification produce economic, energy and environmental benefits for the fleet and School District.

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# 4. INFRASTRUCTURE AND FACILITY PLANNING

Detailed site planning is critical to a smooth transition to electric school buses. Close coordination between your school bus provider, your local utility, your electrical contractor, and any EV consultants is essential to avoid delays and excess costs. The location of charging stations is perhaps the most important decision, as it will affect the cost of installing the charging stations and ensure that buses can be moved around the parking area while buses are being charged.

## SITE PLANNING

Siting your charging stations needs to be carefully thought out. To reduce utility and trenching costs, you want the charging stations to be located as close as possible to your existing electrical service infrastructure.

However, you also need to look at how the proposed location of the charging stations impacts bus movement in your storage yard. Buses may have to be moved around to allow multiple buses to be charged at the charging station each night.

A qualified EV consultant can help your plan all of this out.

## UTILITY CONNECTIONS

Connections to the local utility company are often a critical component of the process of putting electric school buses into service. A fleet of electric school buses will require higher voltage service than is typically delivered to a bus facility, and due in part to recent Covid-related supply chain issues, there may be a long wait time for the necessary service to be delivered.

Your electrical contractor, in conjunction with your dealer, can help define how much power capacity the utility needs to deliver.

In planning your electrical requirements, contact your local electrical utility service provider as soon as you start thinking about acquiring electric school buses to let them know that you are planning to electrify your bus fleet. Ask them to do a site survey with you and your consultant, if you have one.

Information that the utility will need includes:

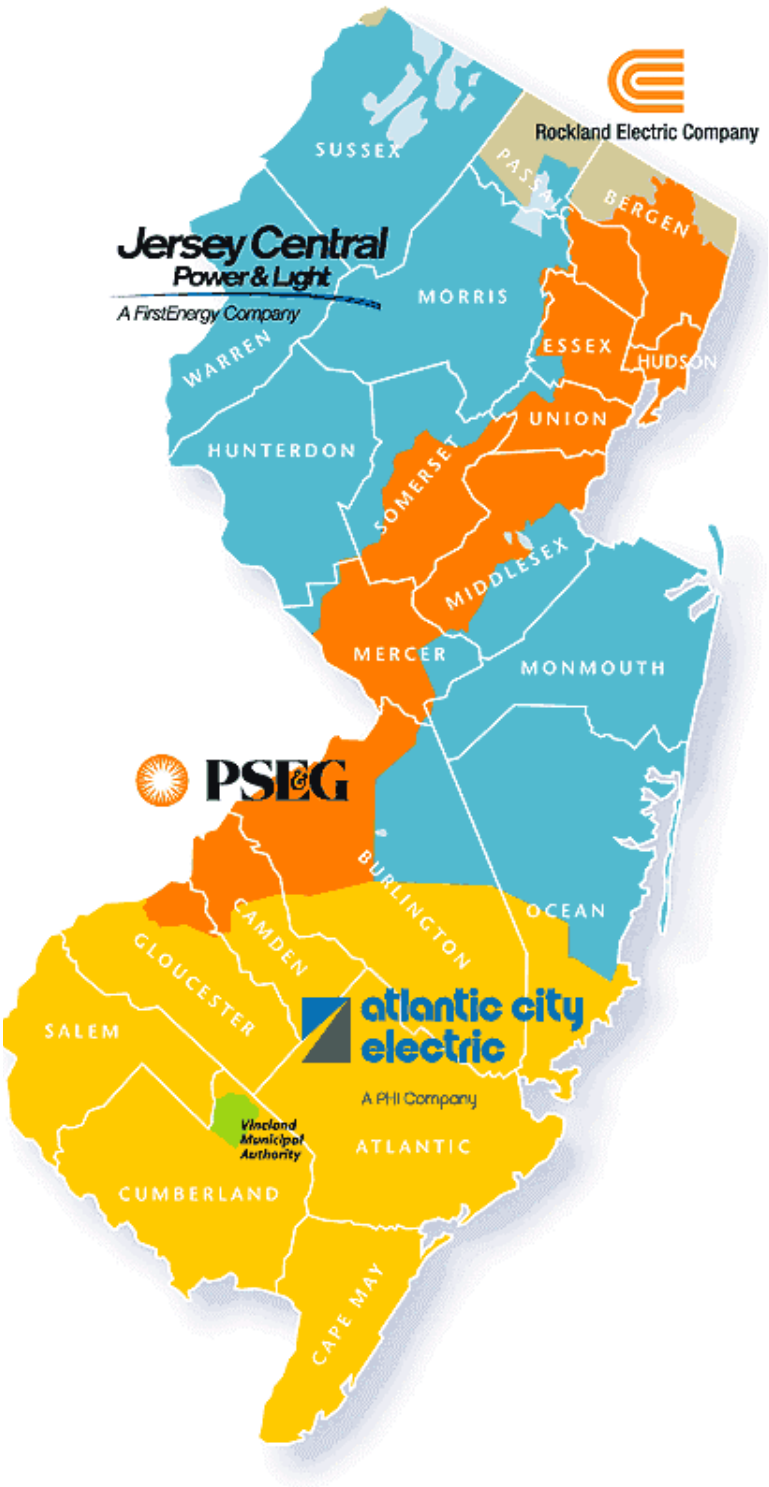
- The number and type of vehicles to be charged
- The anticipated deployment timeline
- The number and type of charging stations you will purchase (e.g., Level 2 or DCFC)
- Where on your property you will locate the charging stations

The utility needs to determine if they have existing capacity to bring the additional power load to your facility. If capacity in the form of higher voltage service needs to be installed, the utility may charge you for the cost of this “make ready” service. Under proposed state guidelines, the utility company can include these costs under its general rate base for school districts and would therefore not charge the district (it is not clear if privately operated school bus contractors would be eligible for this benefit).

As most locations will gradually phase in their transition to electric school buses, discuss with your utility and contractors the most cost-effective schedule to expand utility service to your facility consistent with your transition schedule for fleet conversion.

# UTILITY ENGAGEMENT

**Depicted in this map are New Jersey's four private electric utility company service areas. There are several municipal power authorities that serve communities within the state.**

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## ATLANTIC CITY ELECTRIC

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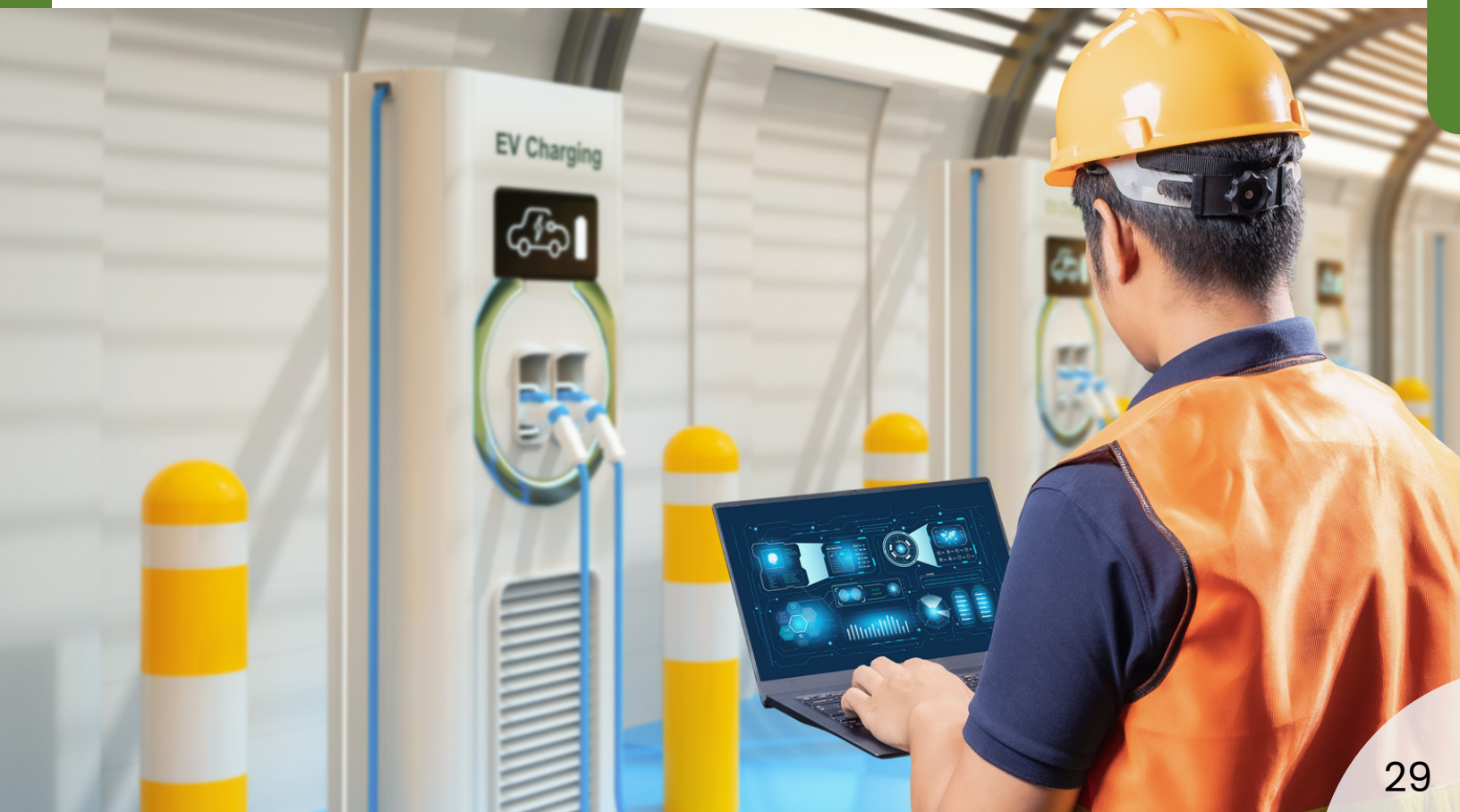
# LOCAL PERMITTING

Once your plans are complete, they must be submitted to your municipal zoning and building inspection officials for approval.

Your electrical contractor will submit the permit applications to your local zoning officials. A site survey is normally required as part of the application process.

Following zoning approval, building, electrical, and construction permits must be obtained from your municipality. These applications must include the proper sub code sheets and construction drawings.

Failure to schedule site inspections in advance may delay your ability to begin service with the electric school buses even if all the infrastructure has been installed and the buses delivered.

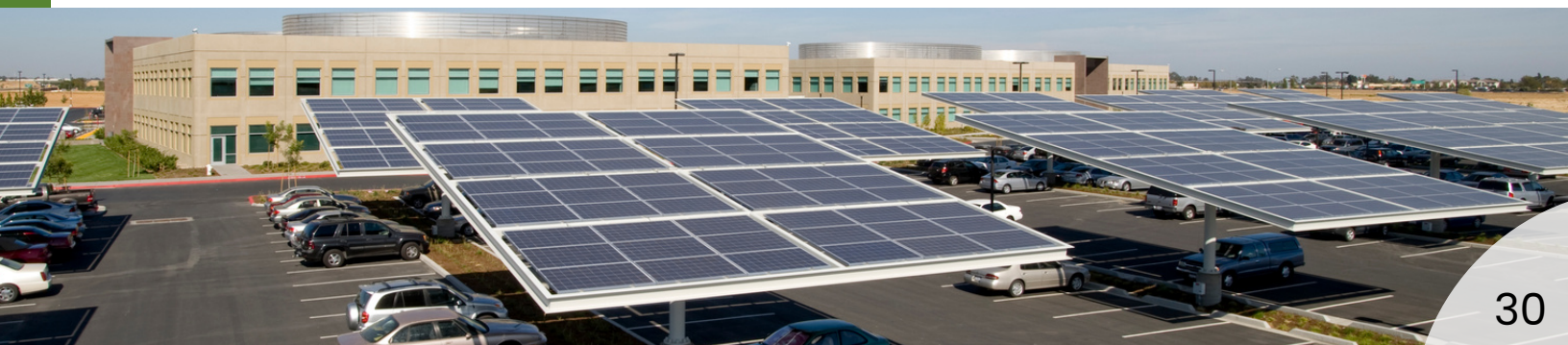


# 5. DISASTER RECOVERY PLANNING

While not a particularly critical issue when you begin purchasing electrical school buses, disaster recovery planning may become a major issue over time as a larger percentage of your fleet is electrified. With storm intensity and frequency increasingly impacting the ability of the electrical grid to provide power, districts should incorporate disaster recovery strategies into their long term plans.

The integration of solar power and battery storage systems within school districts represents a quantum leap in disaster recovery preparedness. Solar panels, with their capacity to convert sunlight into electricity, provide a sustainable and decentralized power source. In the event of a disaster or grid failure, this clean energy can be harnessed to charge electric school buses, ensuring they remain operational for crucial transportation needs. What's more, excess energy generated by the solar panels can be stored in on-site battery systems. This stored energy serves as a vital reserve, guaranteeing that even in the absence of direct sunlight, buses can be charged and deployed swiftly, offering a lifeline for evacuation and relief efforts.

The synergy between solar power and battery storage not only safeguards transportation resources but also fortifies the resilience of the entire district. During emergencies, battery systems kick into action, seamlessly taking over to power essential facilities, including electric school bus charging stations. By reducing reliance on the grid, these integrated solutions ensure uninterrupted service, even in the face of widespread power outages. This innovative approach not only underscores the vital role of sustainable technologies in disaster recovery planning but also exemplifies how school districts can be proactive leaders in creating resilient, eco-conscious communities for the future.



# 6. Grants, Subsidies, and Tax Credits

## STATE OF NEW JERSEY GRANT PROGRAMS

As of this writing, the State of New Jersey has two grant programs available to municipalities and other government agencies to purchase electric school buses and other electric vehicles (such as passenger vehicles, garbage trucks, vans, and transit buses) and charging stations. Private school bus contractors are also eligible to apply for funding on behalf of the school districts they support.

**NJ Dept. of Environmental Protection - Regional Greenhouse Gas Initiative**

The state's participation in the Regional Greenhouse Gas Initiative (RGGI – commonly pronounced Reggie) provides variable funding based on programmatic revenue. NJDEP not only pays the incremental cost of an electric school bus over the cost of purchasing a diesel bus, but also covers the cost of charging stations and the cost of hooking up the charging station to the utility meter. To sign up for notification of application rules and deadlines, districts should register with NJDEP at www.stopthesoot.org.

**NJ Economic Development Authority – NJ ZIP Program**

NJ ZIP is a $90 million voucher pilot launched by New Jersey Economic Development Authority (NJEDA) for medium and heavy duty zero-emission vehicles. This pilot is funded by Regional Greenhouse Gas Initiative (RGGI) proceeds allocated to NJEDA for the purposes of creating economic opportunity within the state and reducing harmful emissions, especially in communities disproportionately impacted by transportation emissions. The program will provide vouchers with base values ranging between $20,000 to $175,000. Their vouchers can only be used to purchase the school bus, and cannot be used for infrastructure such as charging stations. NJZIP is currently closed. Interested districts may sign up for this program to stay up to date on funding availability at NJ ZIP - NJEDA.

# FEDERAL GRANT PROGRAMS

There are 3 federal grant programs available to school districts and private contractors to help pay for electric school buses. Both the Infrastructure Investment & Jobs Act (IIJA) and the Inflation Reduction Act (IRA) provide a combined $6 billion dollars for clean school buses. A third program is funded under the Diesel Emissions Reduction Act (DERA). All three programs are managed by the US EPA.

**Infrastructure Investment & Jobs Act**

The IIJA set aside $5 billion ($1 billion per year for 5 years) to provide grants or rebates to school districts to purchase school buses through the EPA Clean School Bus Program. Of that, half is specifically dedicated to zero-emission buses, e.g., electric buses, and the other half can be used for low emission buses, such as propane, as well as zero-emission electric buses.

Priority for these funds is given to environmental justice communities currently defined by the percentage of students living in poverty, but all districts are eligible to apply. Priority districts can be awarded up to $345,000 per bus plus which includes up to $20,000 per bus for charging stations. That amount is reduced to $200,000/bus for non-priority districts.

The EPA awards funds as either grants or rebates. Rebates are awarded through a random number generated lottery process, and the application forms are simpler and require less details and preparation time. The rebate program also is designed for districts requesting fewer than 25 buses. Grants, on the other hand, are awarded through a competitive process that requires more detail and effort to complete. Applications are evaluated and scored based on an algorithm. Grants are designed for larger purchases of between 15 and 100 buses per applicant.

The application period for the second round of rebate funding is now open and will close on January 31, 2024. Information on how to apply for these grant and rebate funds is available on the EPA's Clean School Bus Program website: Clean School Bus Program | US EPA

**Inflation Reduction Act**

The Inflation Reduction Act (IRA) Clean-Heavy Duty Vehicle Program will invest $1 billion to replace existing heavy-duty Class 6 and 7 commercial vehicles with clean, zero-emission vehicles, support zero-emission vehicle infrastructure, train and develop workers, and support planning and technical activities for vehicle adoption and deployment. The funds will be distributed between now and 2031. $400 million will be going to communities in nonattainment areas. EPA anticipates this new funding opportunity may begin later in 2023.

**Diesel Emissions Reduction Act**

Under the Diesel Emissions Reduction Act (DERA) program EPA solicits applications from eligible entities to accelerate the upgrading or retirement of the nation's legacy diesel engine fleet. Eligible activities include the retrofit or replacement of existing diesel engines, vehicles, and equipment with EPA and California Air Resources Board (CARB) certified engine configurations and verified retrofit and idle reduction technologies. Applications are accepted from regional, state, or local agencies. Eligible vehicles include school buses and other Class 5-8 heavy duty highway vehicles.

In contrast to other federal and state grant and rebate programs, diesel to electric repowers are eligible for funding. Also, since DERA was designed specifically to reduce diesel emissions, greater weight is given to applications that will reduce vehicular emissions in non-attainment air quality districts. Funds are specifically allocated for each EPA region, and similar to the Clean School Bus Program grant cycle, applicants must submit a detailed proposal which is evaluated competitively based on numerous criteria including the potential reduction in air quality pollutants.

Currently, there is a funding cycle that closes on December 1, 2023. Districts that are interested in learning about and applying for future DERA funding should sign up to receive DERA notices at this website: DERA News Signup Form.

# FEDERAL TAX CREDITS

Under the Inflation Reduction Act of 2022, governmental agencies and tax-exempt organizations that buy a battery electric or fuel cell vehicle may qualify for a federal tax credit of up to $40,000 (Internal Revenue Code 45W) even though they normally do not pay taxes. The credit equals the lesser of:

- 30% of the cost of the vehicle, or
- The incremental cost of the vehicle compared with a standard diesel vehicle.

The maximum credit is $7,500 for qualified vehicles with gross vehicle weight ratings (GVWRs) of under 14,000 pounds and $40,000 for all other vehicles. The IRS is still developing the appropriate forms to claim the credit. More information is available at Commercial Clean Vehicle Credit | Internal Revenue Service (irs.gov)

# 7. Additional Resources

- **Sierra Club**

  Electric School Bus Campaign | Sierra Club

  Check out the New Jersey Chapter's webpage for the latest information on legislation, bills and funding.

- **New Jersey Clean Cities Coalition**

  Electric School Bus Training Video Library

  This comprehensive Youtube playlist provides resources on all school bus electrification topics, bringing together the expertise of the National Clean Cities program and the innovative strides made by the MEEP School Bus Electrification Project, all in one convenient location.

- **Environmental Protection Agency**

  EPA Charging Station Planning Tool

  The EPA's new Excel worksheet helps districts and contractors identify necessary information when planning ESB charging.

- **New Jersey Department of Environmental Protection**

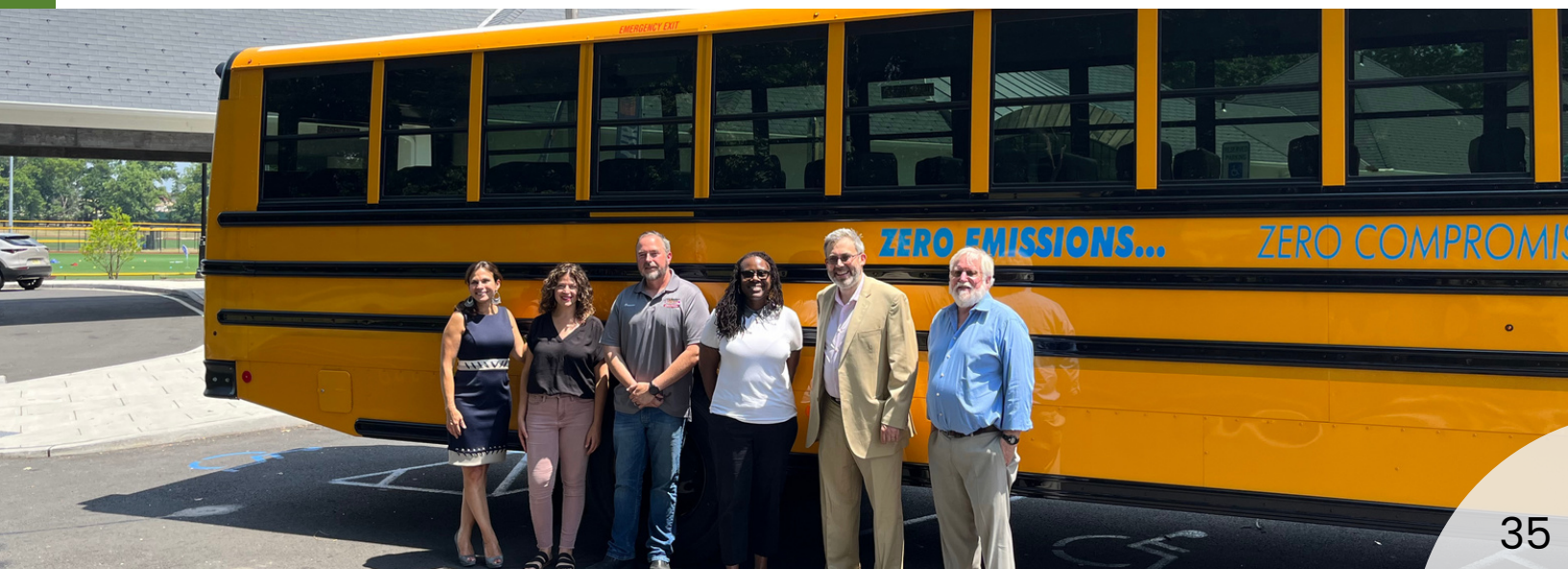
  Drive Green

  An important guide to New Jersey's electric funding and programs.

- **World Resources Institute**

  Step by Step Guide for School Bus Electrification

  A detailed guide to the things to know, steps to take, stakeholders to consult, and questions to ask for a successful and equitable transition to electric school buses.



Electronic version available for download at

http://sierraclub.org/new-jersey/electric-school-bus-campaign

www.njcleancities.org

This document was prepared by the Transportation Committee of the Sierra Club, New Jersey Chapter and the New Jersey Clean Cities Coalition.

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