Electric School Buses

OVERVIEW FOR COMMUNITY STAKEHOLDERS

NEW YORK STATE

NYSERDA
New York State Energy Research and Development Authority

School Bus Overview

Diesel & Gas School Buses

- The combustion of diesel and gasoline emits harmful pollutants linked to asthma, cancer, and cognitive impairment
- Emissions drift back into the bus when the bus is stopped and can remain there.
- Asthma is a leading cause of health-related school absenteeism, which contributes to worsened academic performance

New York is Switching to Electric School Buses

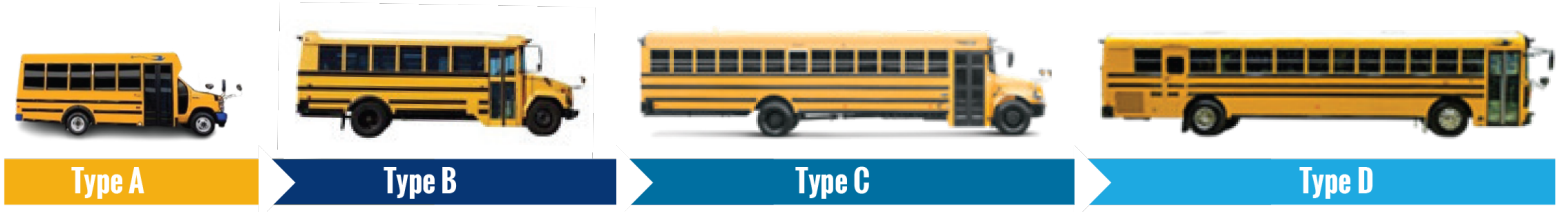
- To reduce emissions and improve student health the State is transitioning to electric school buses
- 2022 NYS law requires that by 2035 New York's entire school bus fleet must be zero-emission[1]
- Starting in 2027 all new bus purchases must be zero-emission buses

[1] *Zero-emission buses could be hydrogen or electric. However, there are no hydrogen school buses on the market, so the focus is on electric school buses (ESBs)*

Electric School Bus Facts

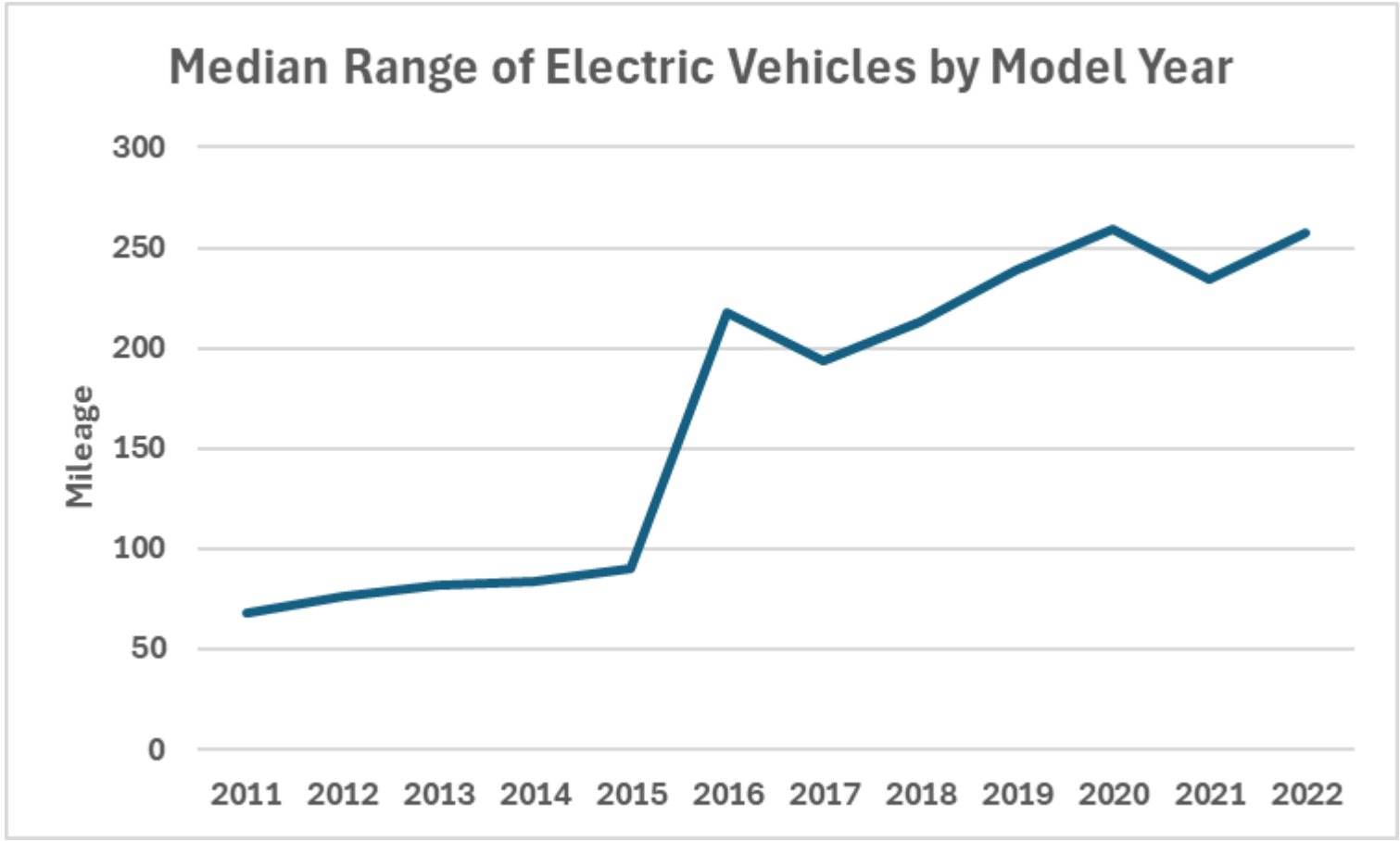
Electric School Buses

- Electric school buses (ESBs) are a clean alternative to diesel and gasoline buses
- ESBs have been in operation for over a decade but are just becoming mainstream
- ESBs are on the road across the USA
- ESBs have zero tailpipe emissions, and are virtually silent (a big change from diesel buses!)
- All major school bus manufacturers make electric models and new companies are entering the market



Range

- ESBs can travel 100-200 miles or more on a single charge.
- The average NYS school bus travels 80 miles per day
- Routes that are not electrifiable today can be electrified as the technology continues to improve and longer-range batteries become available (the same process that has happened with electric cars)



US Department of Energy, Vehicle Technologies Office.

Cold Weather

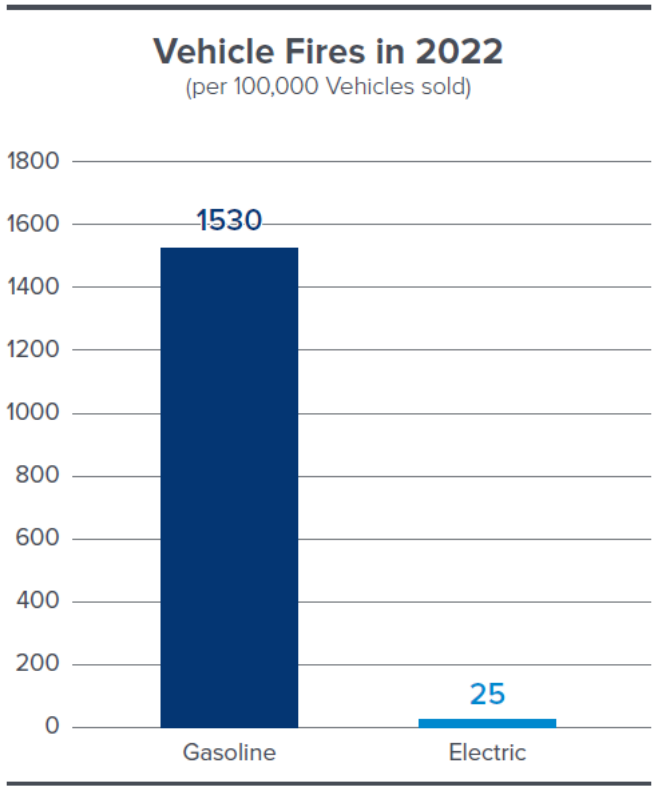
- Batteries function at their highest efficiency when it's warm outside. When it's very cold or hot the battery still works, it just has to work harder. Schools can develop fleet electrification plans, which consider winter temperatures and recommend appropriately sized bus batteries.
- There are electric school buses on the road across the US and Canada, including in Quebec, Montana, and Minnesota- all cold climates.
- On a normal day a bus might be able to travel 150 miles. But if the temperature drops to 10 degrees it might only be able to travel 50-60% of its rated range (75 to 90 miles)

Electric school bus in Steamboat Springs, Colorado

Safety

Electric vehicles of all sizes have an excellent safety track record- for example, they are less likely to be involved in fires than gas/diesel vehicles. In 2022 per 100,000 vehicles on the road there were 1,530 gasoline-powered vehicles involved in fires compared with only 25 electric vehicles per 100,000 EVs on the road.[1]

With proper detection, which all ESBs include, battery malfunctions can be addressed before overheating leads to a fire.



1. Kelly Blue Book analysis of all vehicles classes (buses, cars, and trucks)

ESB Costs

- Electric buses cost more upfront than diesel/gasoline buses. But it costs less to operate and take care of them over the long term.

- In addition, federal and state programs can help school districts buy and install buses and chargers.

- School districts will receive reimbursement from the State through Transportation Aid in proportion to their aid ratio, which is as high as 90% for some districts.

ESB Charging Costs

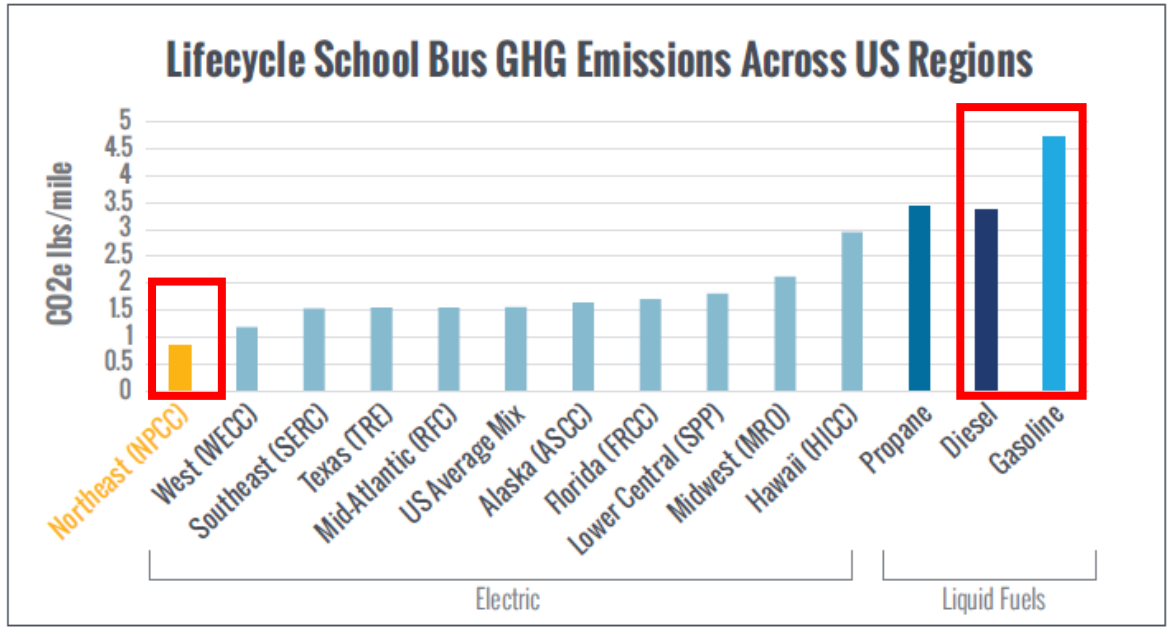
Electricity costs less than gasoline or diesel on a per-mile basis, and the cost is more predictable.

Electricity rates can be further reduced by charging at night, when rates are lowest.

Dollars per gasoline gallon equivalent in the United States since 2011 (US DOE)

Life Cycle Emissions & the Grid

- The life cycle greenhouse gas emissions of an ESB (including vehicle manufacturing and fuel production) are ¼ to ⅓ those of a gas or diesel bus
- The Northeast grid is particularly clean and getting cleaner. By 2040, 100% of New York's electricity will come from zero-emission sources
- New York is moving quickly to electrify transportation, and the grid will be ready. The NYS Public Service Commission (the entity that regulates the utilities) has directed the State's utilities to proactively plan for increased transportation and building electrification.



Lifecycle CO_2e emissions per mile- ESBs by North American Electric Reliability Corporation (NERC) region vs diesel, gasoline, propane vehicles

Electric School Buses on the Road in NYS

Lake Shore

“This is the third year Lake Shore CSD has had zero emission buses in service. Our students enjoy the quiet ride, drivers appreciate less shouting, and staff have gained valuable experience in safely operating battery electric vehicles."

Perry Oddi

Transportation Supervisor

Lake Shore Central School District

Pine Valley

“We have had our first ESB in service for over 3 months now. We are using it on one of our longest runs and the students are pleased with a quieter ride each day and our driver has been quick to learn about the benefits of regenerative braking, charging and battery range."

Kristin Sercu

Transportation Supervisor

Pine Valley & Cassadaga Valley Central School Districts

Johnson City

“This is an exciting time to be in the transportation industry. We are seeing many new technologies being added to enhance the school bus experience for drivers and students. The Electric School Bus comes with its learning curve but its benefits can be seen by drivers, students and community members.”

Elizabeth Fox

Director of Auxiliary Services

Johnson City Central School District

New York City

“NYCSBUS has been operating electric school buses since September 2023 from a number of manufacturers and they are terrific. Quiet, easy to drive, reliable, plenty of AC in NYC's humid summers, heat works great in the winter. Our drivers love driving them and the parents and kids like being part of the future.”

Matt Berlin

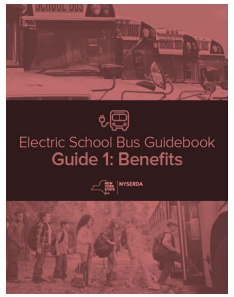
Chief Executive Officer

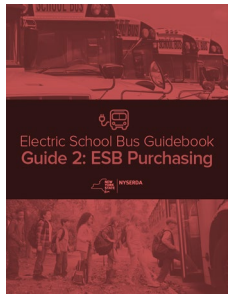
New York City School Bus Umbrella Services (NYCSBUS)

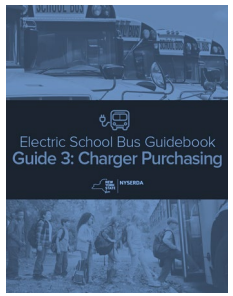
Assistance Available to School Districts

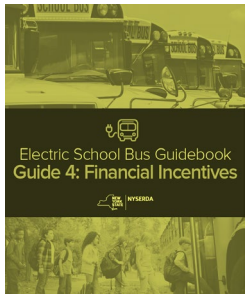
NYSERDA Educational Materials

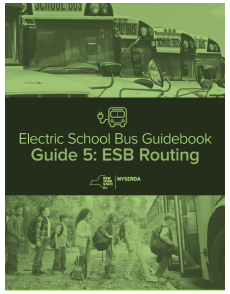
- **NYSERDA Electric School Bus website** - overall site for ESB information including the above topics. Can be found at nyserda.ny.gov/esb
- **ESB Webinars** – sign up for upcoming webinars, and see recordings on past topics
- **Electric School Bus Guidebook** - provides living resources to help fleet owners and key partners get familiar with key terms, concepts, and near-term actions to take.

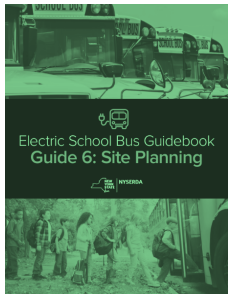


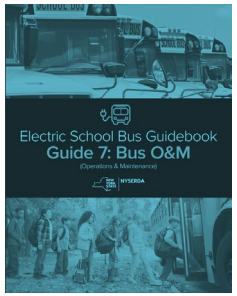


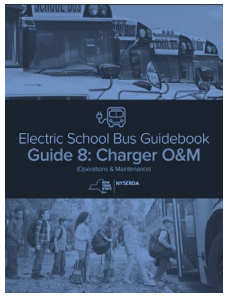


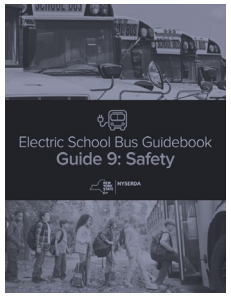


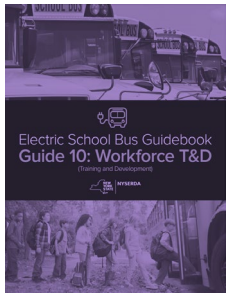












Fleet Electrification Plans (FEPs)

NYSERDA offers to help pay for school districts to work with engineering firms to create a personalized fleet electrification plan that looks at the specifics of a district's routes, terrain, weather, depot locations, and utility service provider.

A Fleet Electrification Plan helps districts determine when to electrify each route and includes recommendations on bus and charger purchases and site planning.

Fleet Electrification Plans (FEPs)

Every district and school bus contractor is eligible for FEP assistance from NYSERDA.

NYSERDA pays for 100% of the cost of FEPs for Priority districts, and 75% for other districts. If a school district contracts out its fleet the coverage ranges from 50-100%.

NY School Bus Incentive Program (NYSBIP)

NYSERDA administers the $500 million NY School Bus Incentive Program (NYSBIP) which helps districts and school bus contractors:

- Purchase buses
- Purchase chargers and install charging infrastructure

Every school district and third-party bus operator is eligible for NYSBIP funds.

Priority districts are eligible for increased funds

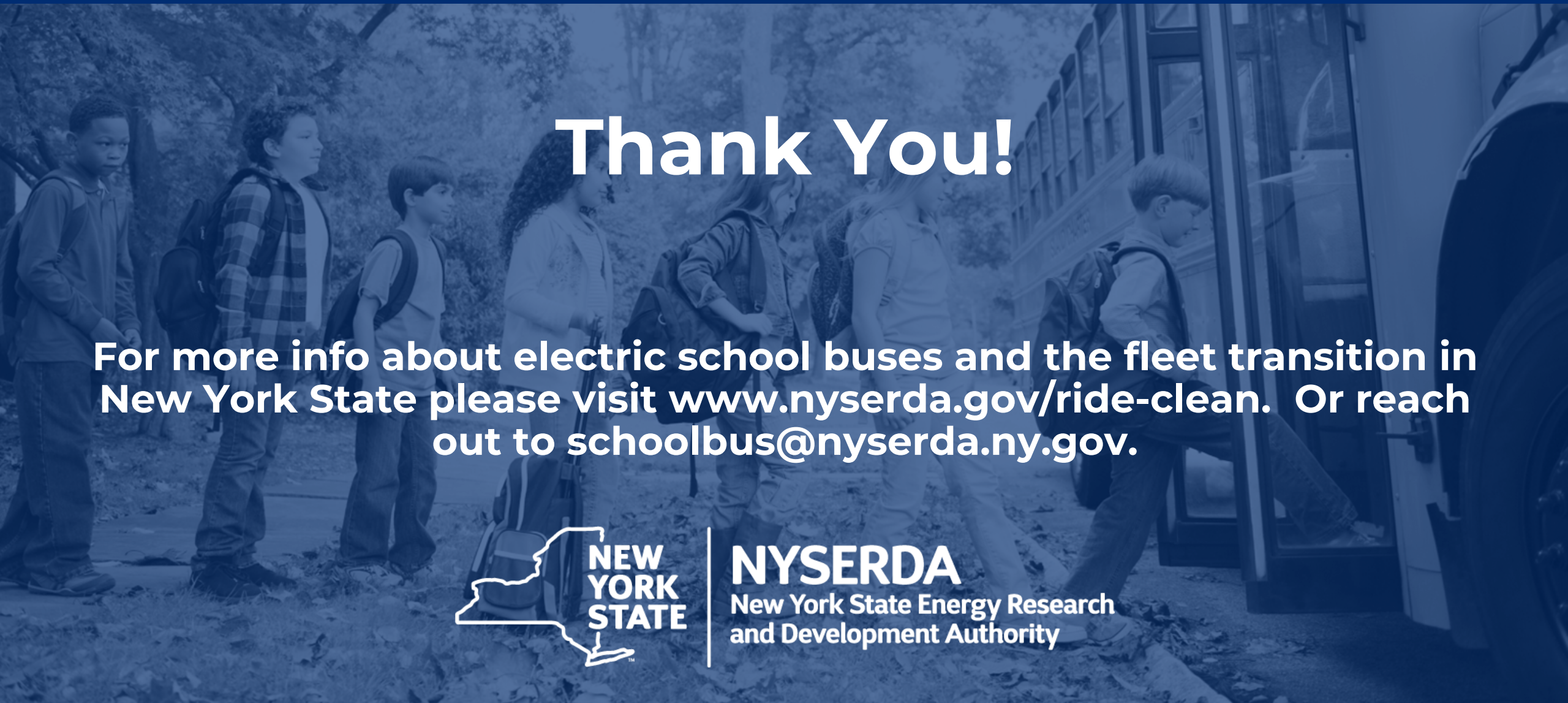
Other Funding Sources

The Federal Government provides billions of dollars in funding for electric school buses and chargers through the **EPA Clean School Bus Program.**

And the IRS provides funding through the **Commercial Clean Vehicle Credit** and the **Alternative Fuel Vehicle Refueling Property Credit**.

Most utility-providers in NYS also offer funding through **Make-Ready Pilot Programs.**

Electric School Buses



Thank You!

For more info about electric school buses and the fleet transition in New York State please visit www.nyserda.gov/ride-clean. Or reach out to schoolbus@nyserda.ny.gov.

NEW YORK STATE

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