



**Electric
School Bus**
INITIATIVE

ELECTRIC SCHOOL BUSES AND THE ROAD TO DECARBONIZATION

EESI Briefing: Back to School: Catalyzing Climate Action in K-12 Schools, September 28, 2022

ABOUT WRI

WRI is a global research organization that turns big ideas into action at the nexus of environment, economic opportunity and human well-being.



OUR AIM: ELECTRIFY THE ENTIRE U.S. FLEET BY 2030

- Partner with communities, school districts, industry experts, manufacturers, utilities, and policy makers to **transform and electrify** the school bus market
- Together, build unstoppable momentum to **electrify** 480,000 school buses in the U.S. by 2030
- Ensure an **equitable transition** by focusing on underserved communities



THE DECARBONIZATION OPPORTUNITY

School buses represent a unique opportunity to influence greenhouse gas emissions in both the transportation and energy sectors.

Build out medium-and-heavy-duty EV manufacturing capabilities

Advance medium-and-heavy-duty battery production and design

Support renewable energy grid integration

Normalize electric mobility for an entire generation

WHY ELECTRIFY THE U.S. SCHOOL BUS FLEET?

Electrification can accelerate decarbonization while bringing direct, tangible benefits to every community



Improved health and cognitive outcomes for children



Cleaner air than with diesel buses, especially in communities of color



Reduced operating expenses for school districts



New jobs in green manufacturing



A **tipping point** for MHD + electrification



Enhanced **resiliency** and **renewables integration** with V2G

DIESEL BUSES HARM HEALTH & DEVELOPMENT

- Diesel exhaust pollutants can lead to **asthma, cancer and other respiratory illnesses**.
- There are **documented negative impacts** on both student health and academic performance – and there is increasing evidence that **children are particularly susceptible**.
- Diesel exhaust pollution is a **known carcinogen**.
- Reducing students' exposure to air pollution from school buses has **positive and significant effects on some test scores**.



THE BURDEN OF AIR POLLUTION IS INEQUITABLE

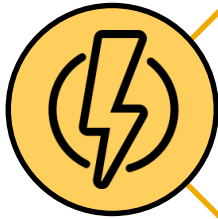


- **60% of low-income students** take the bus compared to 45% of non-low-income students
- Fine PM exposure from on-road sources can be **75% higher for Latinos, 73% higher for Asian Americans, and 61% higher for African Americans**
- Native American children are **1.5 times more likely to have asthma** as non-Hispanic white children.

THE STATUS OF SCHOOL BUS ELECTRIFICATION



480,000+ school buses in the U.S.



Less than **1%** are electric



School districts in 38 states have deployed or committed to ESBs

ESB ADOPTION GROWTH SURGING

CUMULATIVE NUMBER OF ELECTRIC SCHOOL BUSES COMMITTED BY QUARTER IN THE UNITED STATES (2014-2022)

First U.S. Electric School Buses Begin Operation

California's Kings Canyon School District and Escondido Union High School begin operating first electric school buses with one each

First Large-Scale Utility Program

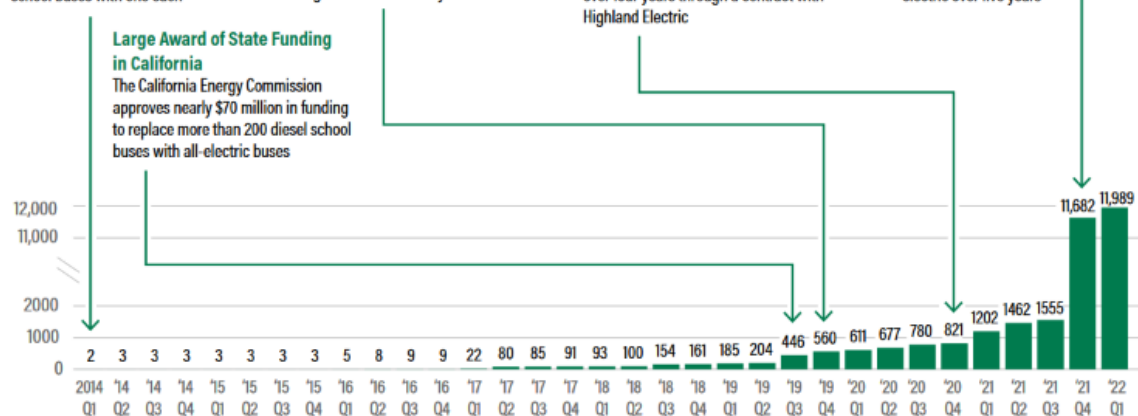
Dominion Energy announces it will offset the additional costs of an electric school bus, including charging infrastructure, for 50 buses across its Virginia service territory

Largest Procurement of Electric School Buses

Montgomery County Public Schools, MD, announces it will replace 326 diesel school buses with electric school buses over four years through a contract with Highland Electric

Largest Partnership for Repowered Buses

SEA Electric and Midwest Transit Equipment announce they will partner to convert 10,000 school buses to electric over five years



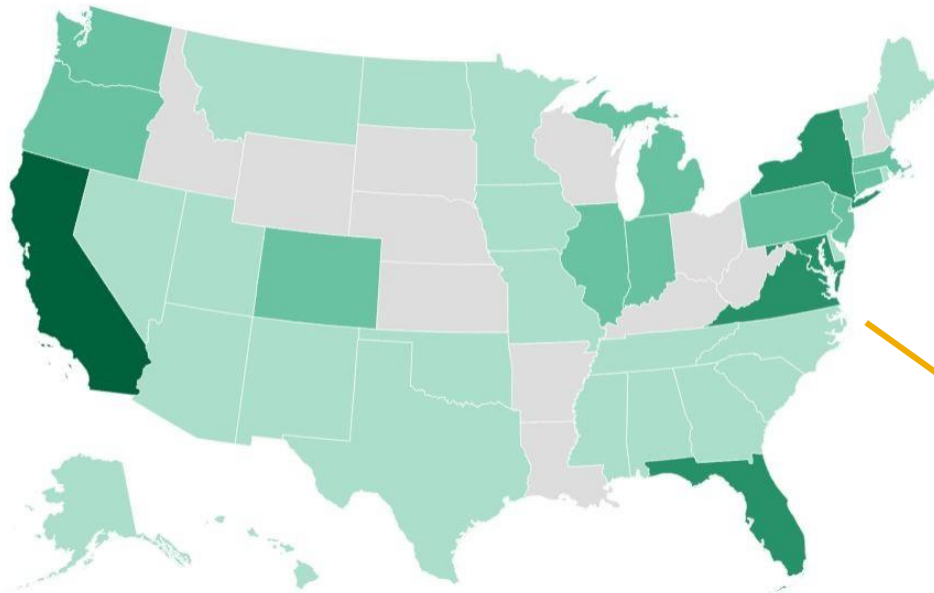
Notes: This graph depicts electric school bus (ESB) commitments at the earliest confirmed phase in the commitment process (awarded, ordered, delivered, or first operating)—286 ESBs were excluded due to unknown dates of their commitment stages. Abbreviation: Q = quarter.

Source: Based on Lazer and Freehafer 2022.

ELECTRIC SCHOOL BUS CONCENTRATION

Committed* electric school buses by state

0 1-10 11-100 101-500 501+



- Electric school buses are operating in **every type of community** and have been committed to in 38 states
- 25% are in school districts in the top quartile for % of low-income households

Leading state commitments:

- California: 1376 electric school buses
- Maryland: 336 electric school buses
- Florida: 218 electric school buses

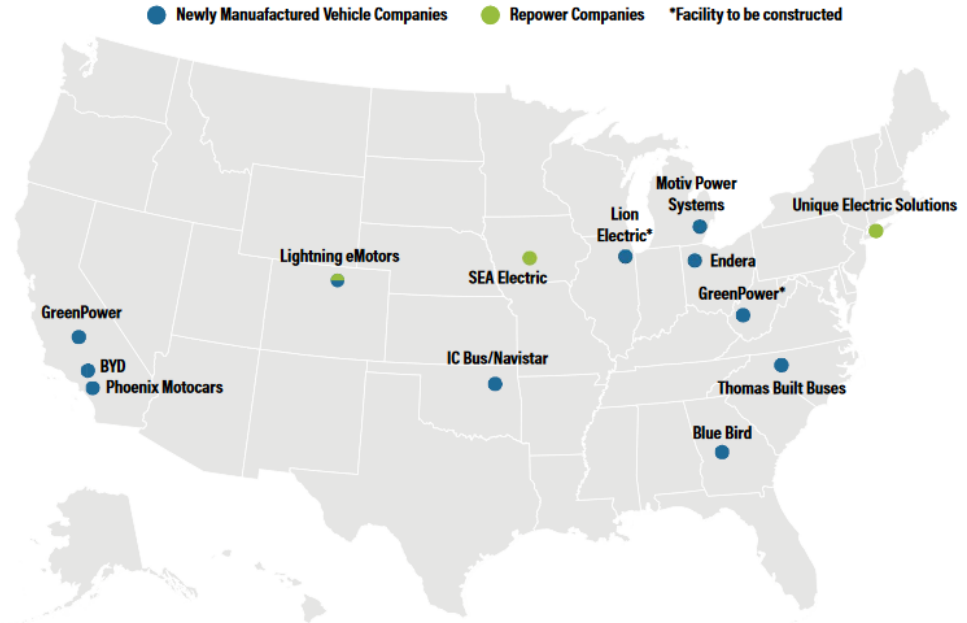
Source: [Lazer and Freehafer, 2022](#) - Data as of June 2022

*awarded, ordered, delivered, or in operation

SUPPLY: MANUFACTURERS SCALING UP TO MEET DEMAND

- Blue Bird: 6x expansion in 2020; more in 2022
- Lion Electric: new IL plant, 20,000 e-trucks/buses per year
- GreenPower: 2x production capacity in 2021; WV facility

MAP OF ELECTRIC SCHOOL BUS MANUFACTURING FACILITIES IN THE UNITED STATES



Notes: This map does not include electric school bus manufacturing facilities in Canada. Lion Electric and Micro Bird both have facilities in Quebec.

Source: WRI authors based on publicly available information.

SUPPLY: GROWING NUMBER OF MODELS

22 ESB models available

- 12 manufacturers across Type A, C and D buses
- Includes newly manufactured and repowered electric school buses

AVAILABLE NEWLY MANUFACTURED ELECTRIC SCHOOL BUSES (TYPE C)

	Blue Bird	Lion	Thomas	IC Bus/Navistar	BYD
MODEL	BLUE BIRD VISION	LIONC	SAF-T-LINER C2 JOULEY	IC CE SERIES ELECTRIC BUS/ PB10E	TYPE C
Price range	\$326,810–\$365,000 ^a	\$338,253–\$422,302 ^b	\$335,287–\$437,000 ^c	\$347,870–\$364,123 ^d	Not available
Length (L)/width (W)/height (H)	L: Max 477" W: 96" H: 123"	L: 473" W: 96–102" H: 122"	L: 396" W: 96" H: 144"	L: 303.9"/474.9" W: 96" H: 123"	L: 435"/462" W: 102" H: 132.9"
Passenger capacity	77	77	81	29–72	78

GROWING MOMENTUM OF REPOWERS

Repower: A process that involves removing a vehicle's original engine and replacing it with a new engine or power source (such as an electric drive system).

- Can help:
 - Reduce upfront price
 - Alleviate supply chain delays
 - Divert waste from diesel buses
- Fleets can have *both* newly manufactured and repowered buses
- Not every bus is a good candidate for repowering – speak with repower OEM

Midwest Transit Equipment and SEA Electric to power 10,000 electric school buses

The Big Deal About NYC's First Electric School Buses Being Diesel Repowers

By Joseph Wachunas January 7, 2022

Infrastructure, Newswire, The



Pioneer Transportation Selects Unique Electric Solutions (UES) to Repower Diesel Buses to Battery Electric



Blue Bird to Offer Electric Repower Option for Gasoline- and Propane-Powered School Buses



- Blue Bird expands collaboration with Lightning eMotors to offer factory certified electric repower program
- Blue Bird customers can future-proof their school bus fleet by purchasing gasoline- or propane-powered vehicles and converting them easily and cost-effectively to zero-emission, electric buses later
- Repowering seen as an excellent bridge strategy to electrification for school bus fleets



NEW FEDERAL CLEAN SCHOOL BUS PROGRAM



In November 2021, Congress passed the bipartisan Infrastructure Investment & Jobs Act, including a **record \$5 billion** to replace older, polluting school buses with cleaner and electric school buses.



That includes **\$2.5 billion in dedicated, standalone funding for electric school buses** and another \$2.5 billion for electric and low-emissions school buses.



EPA has launched the **Clean School Bus Program** to disburse the funding through annual rebate and grant applications, providing multiple opportunities for schools to apply over 5 years.

Department of Transportation, Department of Energy, and other agencies have the opportunity to provide ESB funding beyond the \$5 billion allocated to EPA

CSBP'S 2022 REBATE FUNDING OPPORTUNITY (1ST ROUND)

- **Who is eligible?**
 - School districts, charter schools, Tribes, non-profit school bus associations, and school bus dealers/manufacturers
 - **Priority applicants:** High-need school districts & low-income areas; Rural school districts; Tribal school districts
- **How will it work?**
 - Online applications into a lottery – closed August 19
 - Funds transferred upfront, after order and before purchase/delivery
 - Two years to obtain buses, document disposal of old buses
 - Upgrades needed by utility will *not* be covered – districts starting conversation with their utilities
- **What's Next?**
 - Overwhelming response in this first RFA
 - Applications currently under eligibility review
 - Award announcements expected imminently
 - Next funding opportunity to open later this year – grant applications



CSBP'S 2022 REBATE MAXIMUM AWARDS

Maximum Bus Funding Amount per Replacement School Bus

School District Prioritization Status	Replacement Bus Fuel Type and Size					
	ZE – Class 7+	ZE – Class 3-6	CNG – Class 7+	CNG – Class 3-6	Propane – Class 7+	Propane – Class 3-6
Buses serving school districts that meet one or more prioritization criteria	\$375,000	\$285,000	\$45,000	\$30,000	\$30,000	\$25,000
Buses serving other eligible school districts	\$250,000	\$190,000	\$30,000	\$20,000	\$20,000	\$15,000

Maximum Infrastructure Funding Amount

School District Prioritization Status	ZE – Class 3+ Infrastructure Funding
Buses serving school districts that meet one or more prioritization criteria	\$20,000
Buses serving other eligible school districts	\$13,000

Winners are responsible for any costs beyond maximum rebate amounts

ESB SUPPORT IN THE INFLATION REDUCTION ACT

Additional support for electric school buses via Inflation Reduction Act

- **\$1 billion to electrify medium & heavy-duty vehicles, including school buses**
- **Up to \$40,000/vehicle over 14,000 lbs in a qualified Commercial Clean Vehicle Tax Credit**
- Up to \$100,000/property in the Alternative Fuel Refueling Property Credit (chargers)
- Rural Energy for America Program
- Greenhouse Gas Reduction Fund
- Funding to Address Air Pollution at Schools
- Environmental and Climate Justice Block Grants
- Advanced Manufacturing Production Credit
- Domestic Manufacturing Conversion Grants



STATE POLICY MOMENTUM ON ESBS



Transition targets (NY, CT, MD, ME)



New state (CO, NJ) and utility (IN, MD) funding programs



Modifications to education transportation funding, contract terms, ESB eligibility (WA, ID, MS)



Manufacturing support and adders for in-state produced buses (WV)

ARE YOU READY TO GET ON BOARD?



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THANK YOU

Find out more at wri.org/electric-school-buses