

A photograph of children walking towards a yellow school bus. The children are seen from behind, wearing backpacks. The bus is yellow with black stripes. The scene is outdoors, likely at a school bus stop.

WELCOME!

Michigan Electric School Bus Roundtable

May 10, 2023

Let's Accelerate Michigan's Electric School Bus Future



WORLD
RESOURCES
INSTITUTE



Electrification
Coalition



HOUSEKEEPING

- ❑ **Please Sign In:** First, Last + Organization in chat box now
- ❑ We will be **recording** this roundtable (and share later, with slides)
- ❑ **Speaker Bios** are hyperlinked in agenda - we will send though chat
- ❑ **Chat:** Please use chat for questions throughout the session
- ❑ **Tech Help:** Please chat privately **ECTech**
- ❑ **Survey:** Please give us feedback on our post-meeting survey



@ElectricRoadmap
@WRIRossCities
@eschoolbus4kids

#cleanair4MIkids
#cleanair4kids
#PlugInMI

GET SET FOR SOME GREAT SPEAKERS!



Aaron Viles
Director of Campaigns
Electrification Coalition



Sue Gander
Director, Electric School Bus
Initiative, WRI



**Governor Gretchen
Whitmer**
Governor of Michigan



Janine Ward
Program Manager, Office of
Future Mobility & Electrification,
State of Michigan



Cathy Cole
Director of Strategic Operations
Division, Michigan Public Service
Commission



Cory Connolly
Climate and Energy Advisor, Head
of Office of Climate & Energy,
Michigan DOE



Amaad Hardy
Director of Policy and
Engagement, Greater Grand
Rapids NAACP



Nina Wimberley
Project Coordinator, Southwest
Detroit Environmental Vision



Kareem Scales
CEO & Founder, Scales
Consulting; Co-Chair of C4



Leah Brams
Market Development Associate,
Highland Electric Fleets



Dick Johnson
Sales Manager, EV Charging
Systems for Borg Warner



Mujeeb Ijaz
Founder & CEO, Our
Next Energy



Nate Baguio
Senior VP of Commercial
Development, The Lion Electric Co.



U.S. Representative
Debbie Dingell



State Rep. Ranjeev Puri
District 24



Francisco J. Acevedo
Mobile Source Program
Manager, U.S. EPA - Region 5



Michelle Levinson
Manager of eMobility Financial
Solutions, US Energy Program,
WRI



Kindra Weid,
RN, BSN, MPH, MI Air MI Health,
Coalition Coordinator



Bethany Tabor
Product Manager, Commercial
Electric Vehicles Electric
Transportation Consumer Products



Stephen C. Seelye
Superintendent Pellston Public
Schools



Kenni Jean Schrader
Transportation Supervisor, Three
Rivers Community Schools



Milena Marku
Manager, EV Strategy &
Programs, DTE Electrification
Business Development

Getting to Know Each Other

THREE RIVERS COMMUNITY SCHOOLS

LIONC



Electrification
Coalition



Who We Are

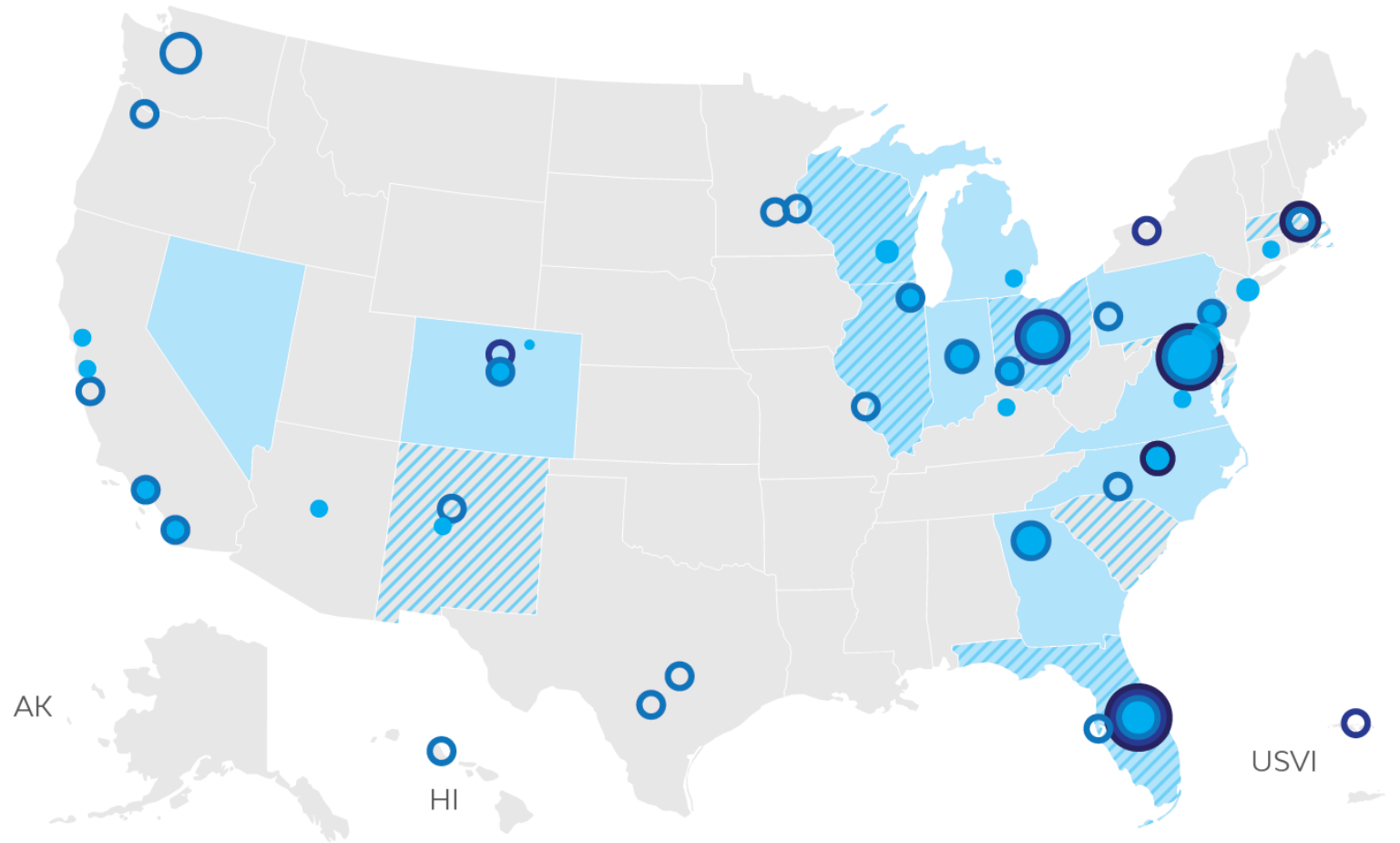
The Electrification Coalition (EC) is a nonpartisan, non-profit organization committed to promoting policies and actions that facilitate the deployment of electric vehicles on a mass scale in order to combat economic and national security dangers caused by our dependence on oil.



90% of U.S. transportation
is powered by oil.

Transportation is Michigan's
largest GHG emitting sectors

The EC National Presence



- Staff Locations
- ACCC Cities
- Smart / Accelerator Cities
- Roadmap Cities
- Priority States
- ▨ State Fleet Cohorts

EV Adoption Programs Around the U.S.



Technical Lead

Climate Mayors EV Purchasing Collaborative



State EV Policy Accelerator

NV, MI, PA, VA, NC



Electrification Advisor

Bloomberg American Cities Climate Challenge



Lead Electrification Partner

Smart Columbus



Federal EV Infrastructure Program

State agency collaboration on EV infrastructure investments (NEVI fund)



Electric Freight Consortium

Private-sector collaboration

**Join us in the
afternoon breakout
groups to discuss
taking actions to
deploy ESBs**

1:20pm-
2:00 pm

Register here:
bit.ly/MI-ESB-Breakouts



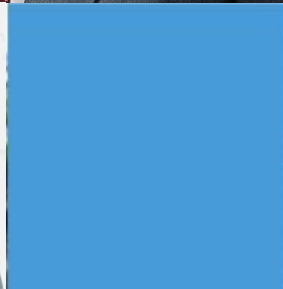
Bus driver Charlie Bogg charging an electric school bus in the parking lot of Anne Arbor's Pioneer High School

Photo courtesy of Mark Houston, DTE Energy



Buckle Up!

Let's Get Started



**We're at
Lunch!
Meet us
back
here at
12:20pm ET**



Bus driver Charlie Bogg charging an electric school bus in the parking lot of Anne Arbor's Pioneer High School

Photo courtesy of Mark Houston, DTE Energy



MICHIGAN: SCHOOL BUS ELECTRIFICATION

A State Summary of Bus Electrification and Key Bus
Indicators

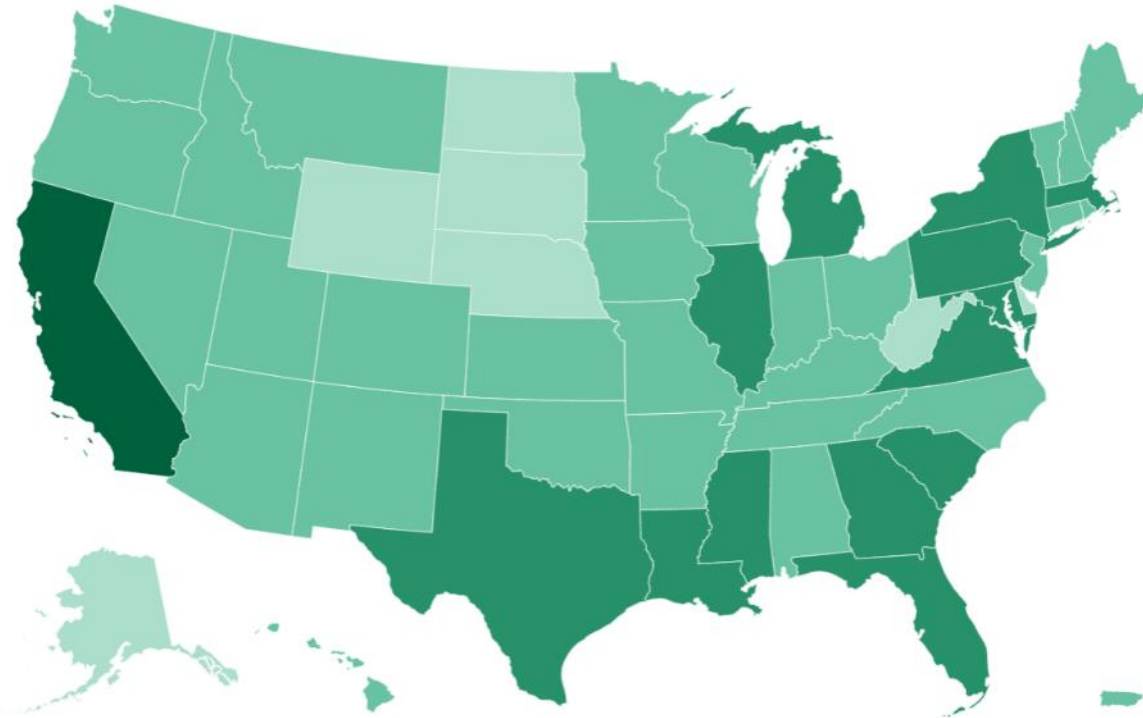
May 2023

ELECTRIC SCHOOL BUSES HIT THE ROAD

Committed Electric School Buses in the United States

5,612 Electric School Buses awarded, ordered, delivered, or in operation

1-10 11-100 101-500 501+



Available School Bus Models

	Range (Miles)	Estimated Price
IC Bus CE	200	\$365,000
LionC	155	\$330,000
LionD	155	\$350,000
GreenPower BEAST	150	Unknown
LionA	150	\$300,000
Thomas Built Saf-T-Liner C2 Jouley	138	\$325,000
Blue Bird All American	120	\$362,605
Blue Bird Vision	120	\$345,765
Collins Type A	105	\$230,000
Blue Bird Microbird	100	\$275,000

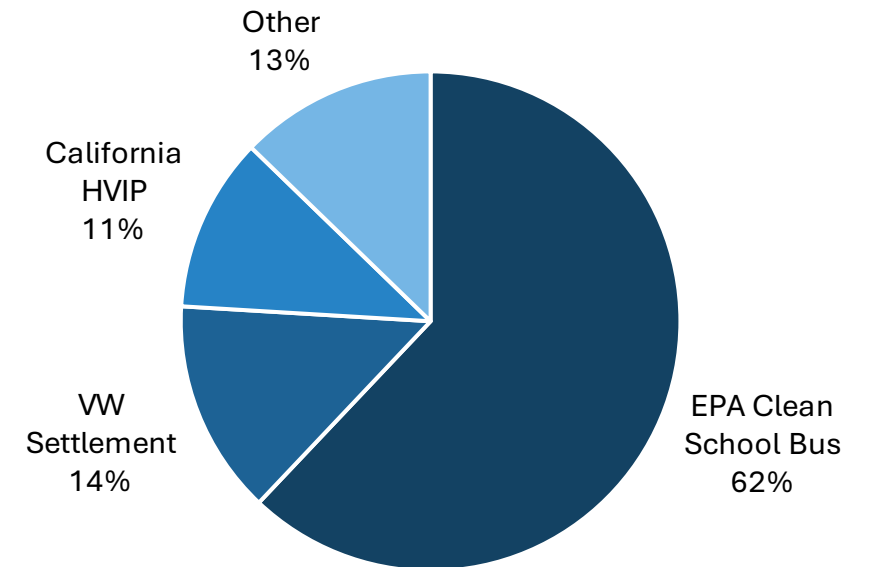
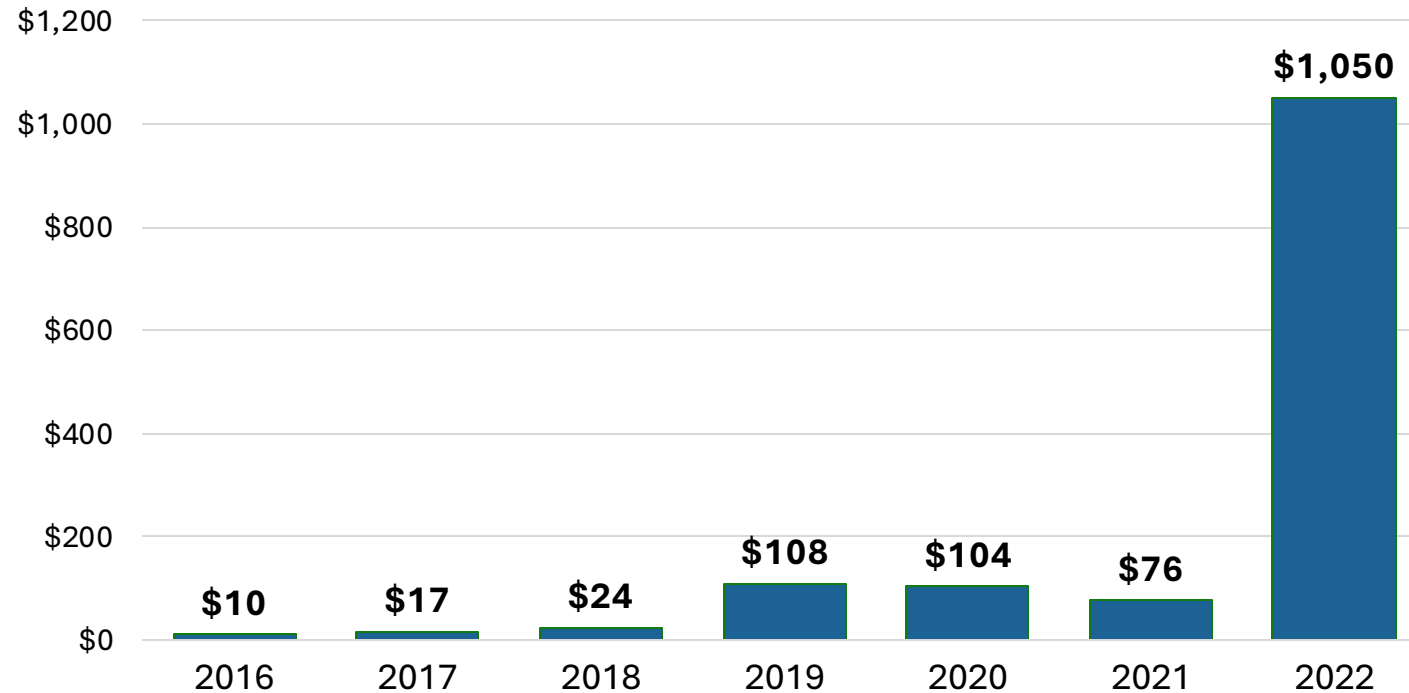
Image from [WRI Electric School Bus Initiative](#). Data from [Lazer and Freehafer, 2023](#). Data as of December 2022. Includes buses awarded, ordered, delivered, or in operation.

Range from manufacturer websites. Estimated price based on data from publicly available bids or contracts.

PUBLIC FUNDING ON THE RISE

Public Funding for Electric School Buses by Year and by Program

Public Funding Awarded (millions)



- \$1.4 billion awarded to date
- 3,962 electric school buses awarded
- \$400 million currently available under 2023 EPA Clean School Bus Program



WHAT MAKES SCHOOL BUSES WELL SUITED TO ELECTRIFICATION?

- Travel consistent routes that rarely exceed 100 miles
- Adequate time to recharge between routes
- Proximity to vulnerable populations (school kids)
- Well suited for vehicle-to-grid

EQUITY



Transportation pollution
experienced most by
communities of color
([Clark et al. 2017](#))



Low-income students ride
school buses (70%) more than
non-low-income students (45%)
([FHA data 2019](#))

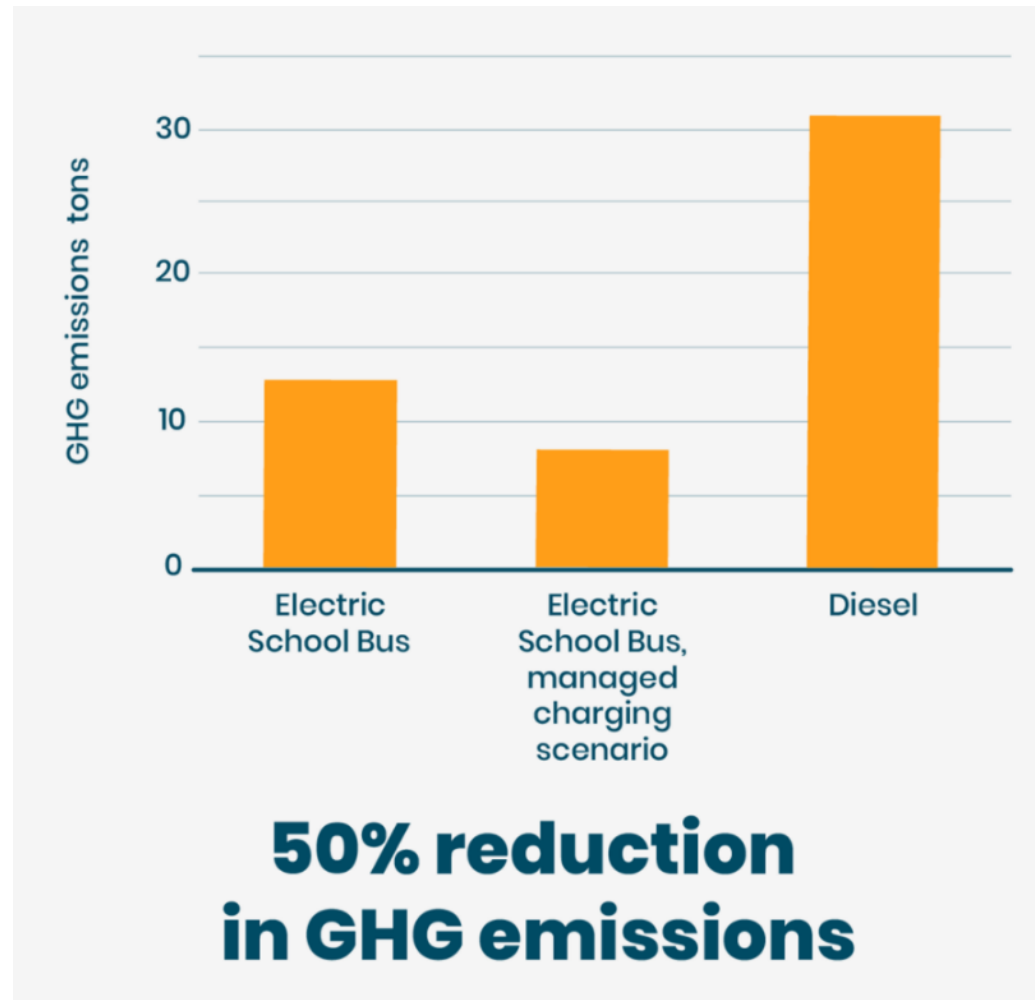


Black Americans are exposed to
24 percent more air pollution
from vehicles than the average
American
([Reichmuth 2019](#))

CLIMATE

- 480,000 school buses nationwide, less than 1 percent electric
- Potential reduction of 8 million tons of greenhouse gases per year if U.S. achieves total electrification of school buses ([WRI 2021](#))
- Zero tailpipe emissions and less than half the overall greenhouse gas emissions of a diesel school bus ([2018 Massachusetts Pilot](#))*

**Depends on emissions profile of the grid. Will continue to get cleaner as more renewable energy is deployed.*



Source: [VEIC \(2018\)](#)

HEALTH

Fine particulate concentrations (PM_{2.5}) on school buses often five to ten times higher than average levels

([Wargo 2002](#))

2002

Replacing diesel school buses means “less pulmonary inflammation, more rapid lung growth over time”

([Adar et al 2014](#))

2014

2011

Replacing diesel school buses linked to “reductions in bronchitis, asthma, and pneumonia”

([Beatty 2011](#))

EDUCATION



Recipients of funding for clean school buses saw higher attendance equivalent to 6 additional students per day
(Pedde et al 2023)



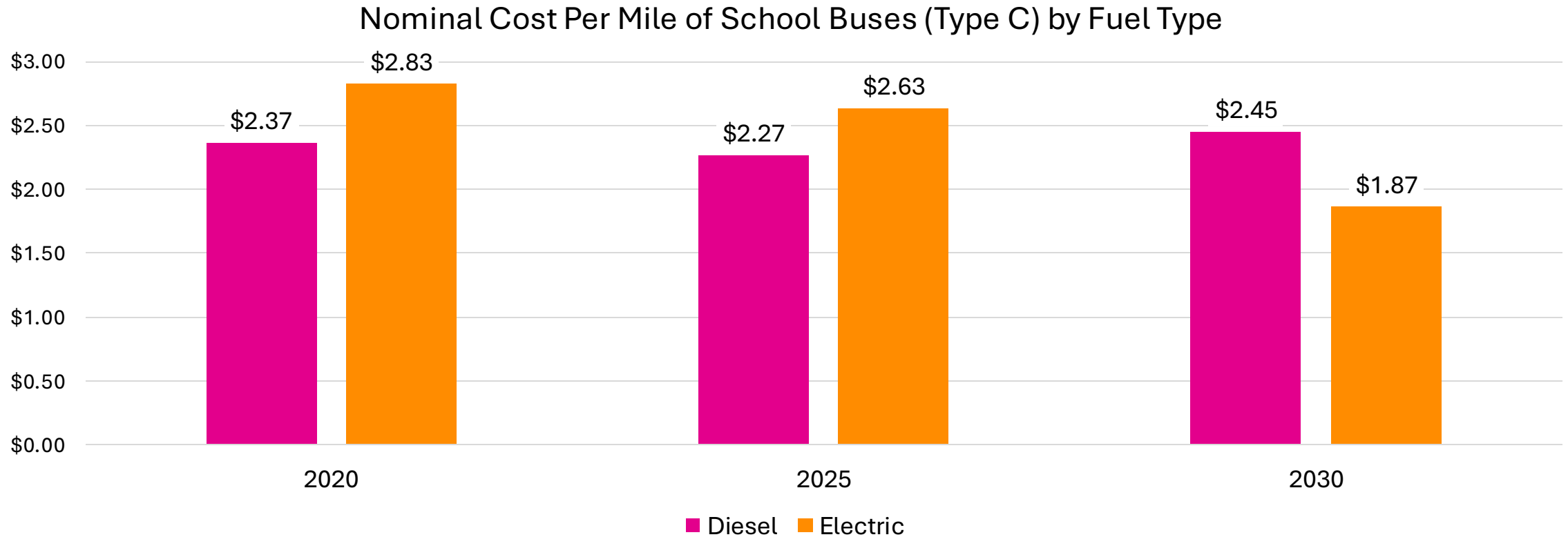
Link between cleaner school buses and higher test scores and school attendance
(Austin et al. 2019)



Proximity to highways linked to lower test scores
(Institute of Labor Economics 2019)

ECONOMIC

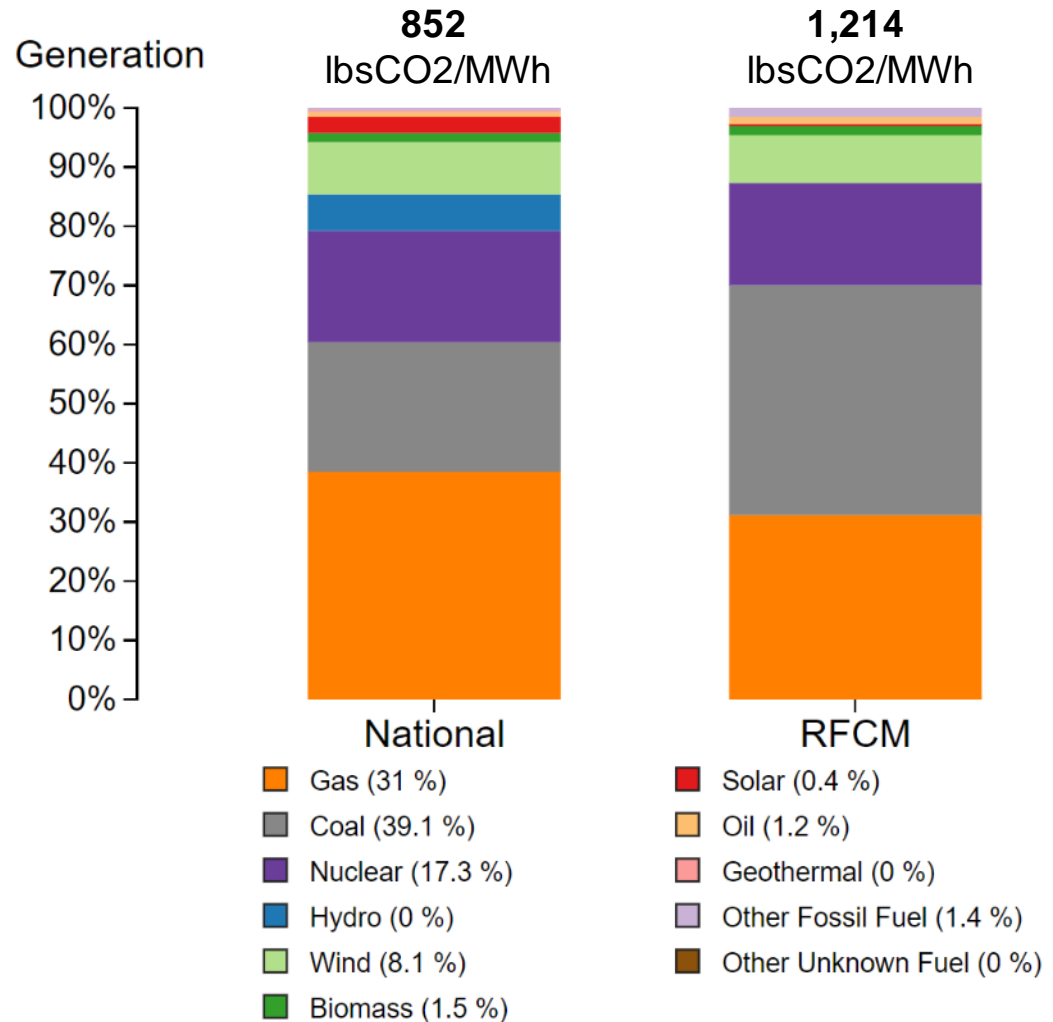
- Cost effectiveness over total cost of ownership expected by 2030
- Potential for vehicle to grid (V2G) revenue, with [multiple utility pilot programs](#) underway
- Potential for more than \$200,000 in lifetime energy cost savings when paired with a distributed energy resource ([NREL 2019](#))



Source: [Atlas Public Policy, 2020](#).

MICHIGAN GRID HIGHER EMISSIONS THAN NATIONAL AVERAGE

- RFC Michigan Grid Mix:
 - 39% coal
 - 31% gas
 - 17% nuclear
 - 8% wind
 - 5% other
- Higher share of coal than national average
- Higher CO₂ emissions than national average
- Michigan grid emissions down 8 percent from 2018 to 2021

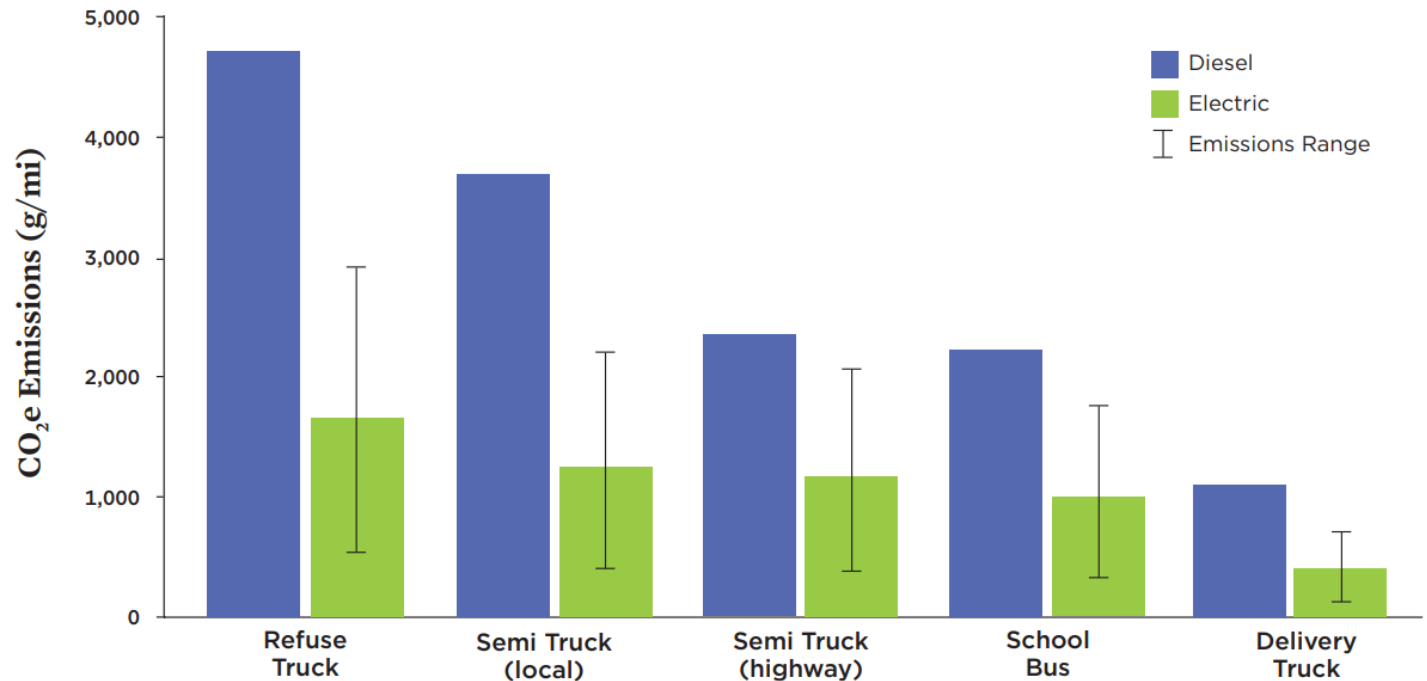


Source: [Power Profiler | US EPA](#)

AN ELECTRIC SCHOOL BUS PRODUCES LESS THAN HALF THE GHG EMISSIONS OF A DIESEL SCHOOL BUS

- [Study \(2019\)](#) shows emissions of MDHD vehicles based on national average grid emissions
- Average electric school bus emits less than half the GHG emissions of diesel school bus

FIGURE 5. Life Cycle Global Warming Emissions for Different Heavy-Duty Electric Vehicles on the Average US Grid (generation-weighted) in 2016



Per-mile life cycle global warming emissions vary for different types of heavy-duty vehicles depending on a vehicle's fuel efficiency. Shown are life cycle emissions from diesel and electric versions of five common heavy-duty vehicles. Bars for electric vehicles represent life cycle global warming emissions for vehicles charged on the average grid in the United States. Range bars represent emissions from the most and least carbon-intensive electricity grids in the United States.

Note: Fuel economies for the electric refuse truck and school bus were estimated based on the fuel economy of the corresponding diesel vehicle and its average speed. Fuel economies for the electric delivery truck and semi trucks were measured directly.

SOURCES: CARB 2018B; EPA 2018B; SANDHU ET AL. 2014; BARNITT AND GONDER 2011.

MICHIGAN SCHOOL BUS INDICATORS



On the Road*

- 19,894 School Buses as of 2019
- 3.6% of National Total



Alternative Fuel Buses on the Road*

- 438 Alternative Fuel School Buses
- 6+ Electric School Buses



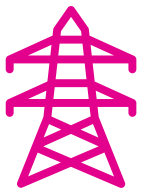
Commitments*

- 157 Electric School Buses Committed
- 8th of All States



Policy Environment

- 2 Supportive Policies
- 3 Incentive Programs



Utility Investment

- Approved: \$29 Million
- Filed: \$1.5 Million



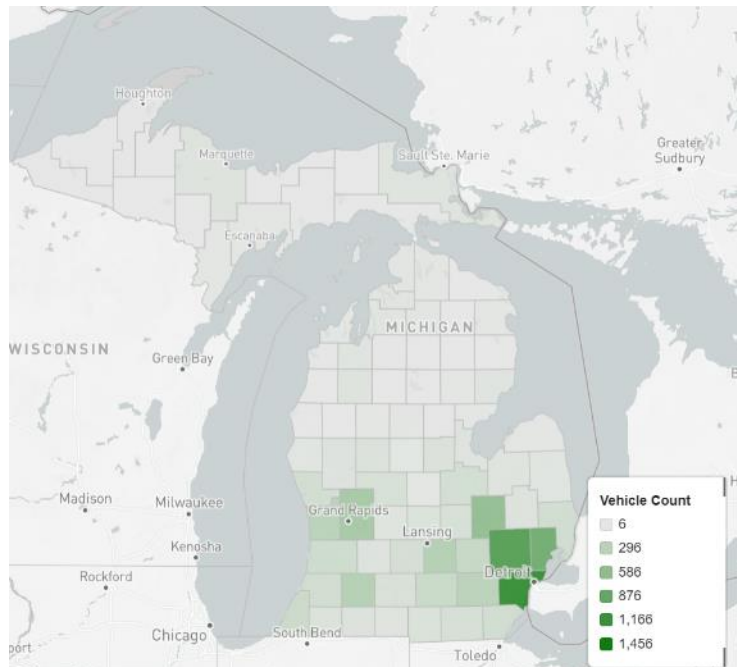
Government Funding

- \$4.4 Million Awarded
- 12th in the Nation
- 18 Buses Committed

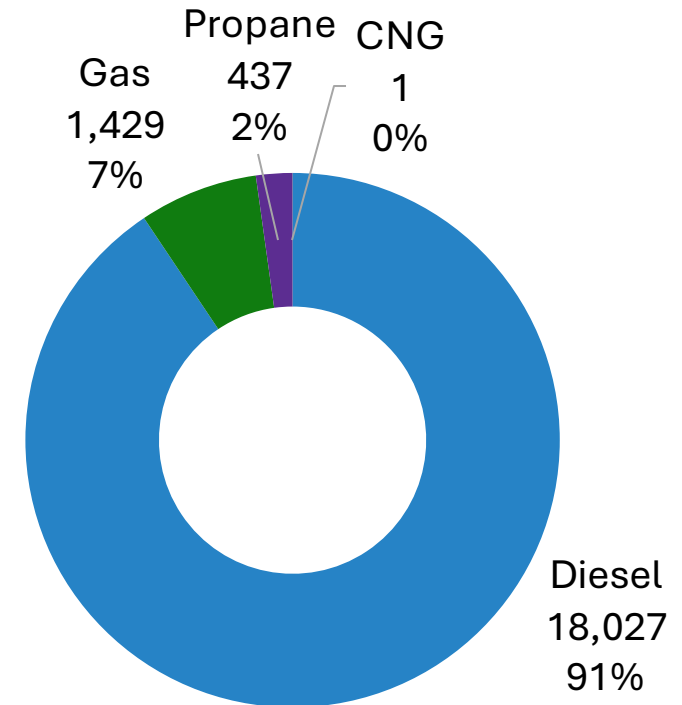
**School Buses on the Road represents a snapshot from 2019. Commitments represents electric school buses awarded, ordered, delivered, or in operation from [Lazer and Freehafer, 2023](#).*

NEARLY 20,000 SCHOOL BUSES ON THE ROAD IN MICHIGAN

School Buses by County



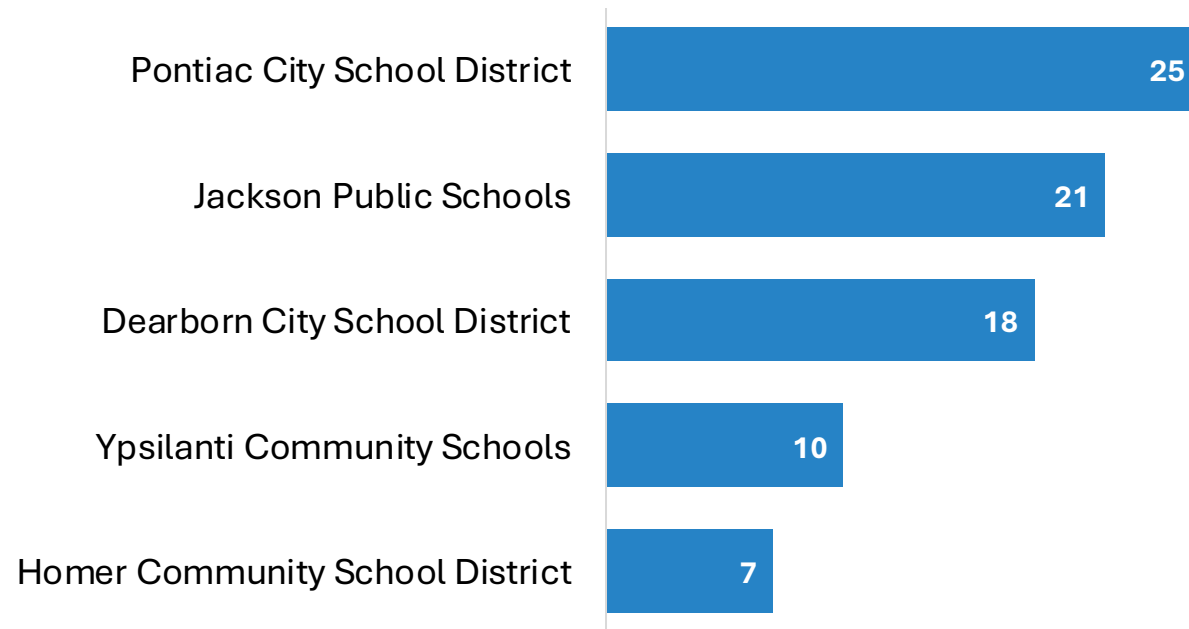
School Buses by Fuel Type



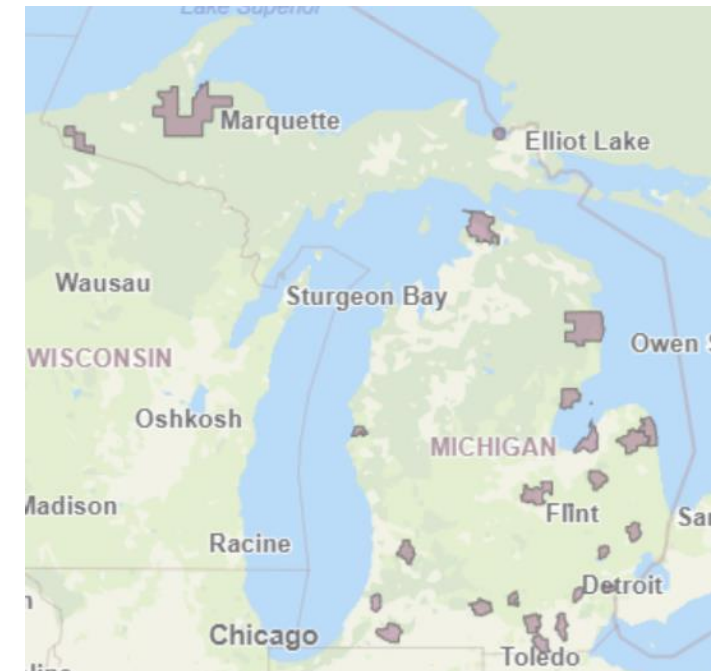
School Bus Stock Data as of EOY 2019.

\$54 MILLION AWARDED FOR 135 ELECTRIC SCHOOL BUSES FROM CLEAN SCHOOL BUS PROGRAM

Top 5 School Districts by Buses Awarded



Recipient Locations



UTILITY INVESTMENT IN ELECTRIC SCHOOL BUSES IN MICHIGAN

DTE – approved to invest **\$44 million** in Charging Forward program including advisory services, make-ready infrastructure, and EVSE rebates for electric school bus fleets

Consumers Energy – approved to invest **\$12 million** in PowerMiFleet program including make-ready infrastructure and rebates for electric school bus fleets

POLICY SUPPORT RAMPING UP

Infrastructure Investment and Jobs Act

President Biden signs IIJA, including \$5 billion for a clean school bus program to be administered by the EPA



November 2021

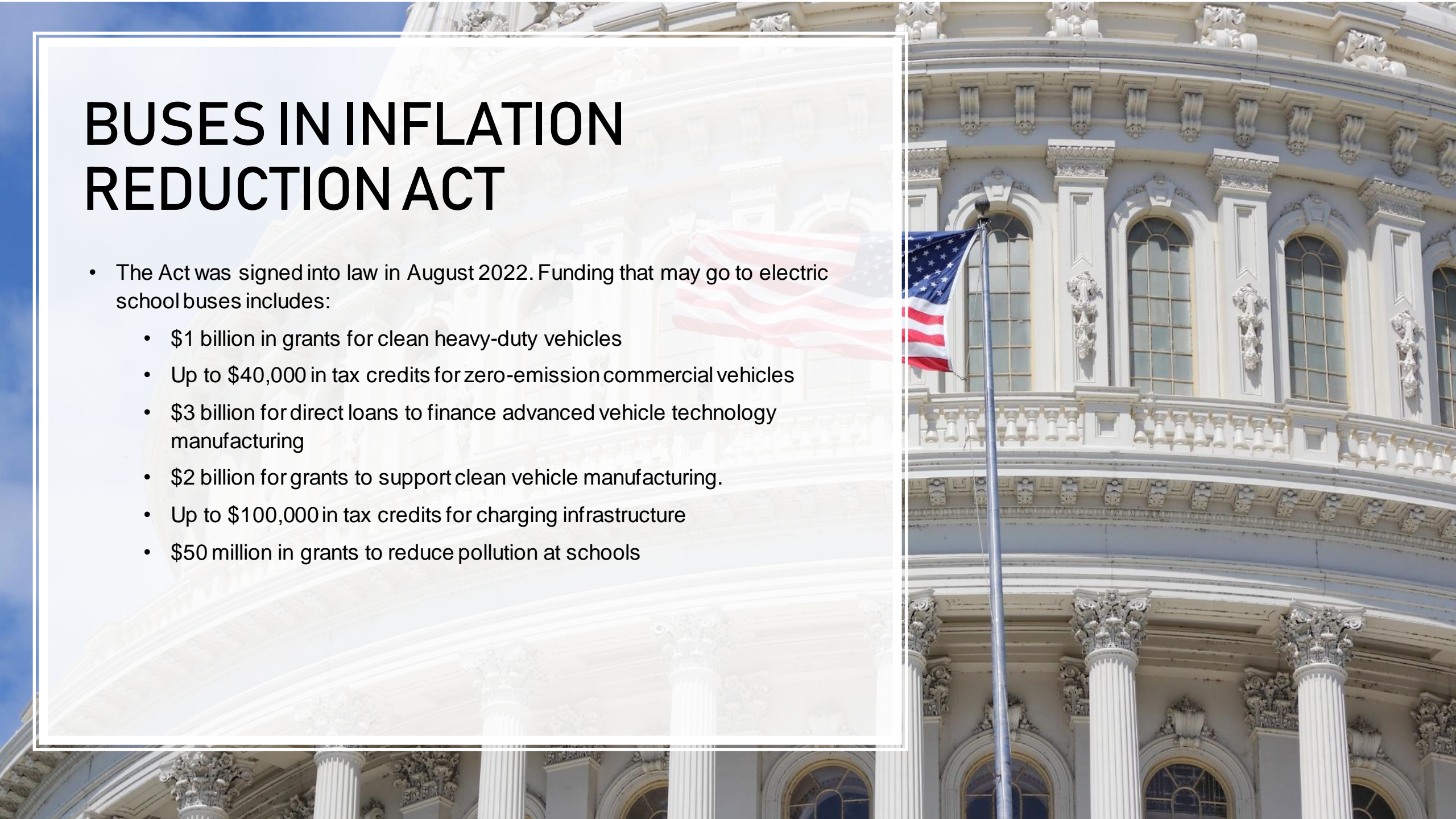
August 2022

BUSES IN INFRASTRUCTURE INVESTMENT AND JOBS ACT

- The Act (HR 3684) was signed into law on November 15, 2021
- Total funding of \$50.3 billion in EV *eligible* funding including:
 - \$8 billion for EV *dedicated* funding
- Funding for electric school buses
 - Clean School Bus Program (\$5 billion)
 - \$2.5 billion for zero emissions vehicles
 - \$2.5 billion for low emission vehicles (including electric)
 - State Energy Plans (\$500 million)
 - Grants for Energy Efficiency Improvements and Renewable Energy Improvements at Public School Facilities (\$500 million)

BUSES IN INFLATION REDUCTION ACT

- The Act was signed into law in August 2022. Funding that may go to electric school buses includes:
 - \$1 billion in grants for clean heavy-duty vehicles
 - Up to \$40,000 in tax credits for zero-emission commercial vehicles
 - \$3 billion for direct loans to finance advanced vehicle technology manufacturing
 - \$2 billion for grants to support clean vehicle manufacturing.
 - Up to \$100,000 in tax credits for charging infrastructure
 - \$50 million in grants to reduce pollution at schools



Next Steps



For School Districts, Interested Policy Makers, and Advocates



"Time and time again...
You hear people say we
want to be part of the EV
revolution."

Ean Thomas Tafoya, GreenLationos



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THANK YOU to Our Speakers Today!

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May 10, 2023**

Contact:

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Aaron Viles
aviles@electrificationcoalition.org



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Here is the link to register for the afternoon participation session:

<https://us02web.zoom.us/meeting/register/tZ0lf-CtpJlpG9U54rAKoDqoPu6klvmebAGA>