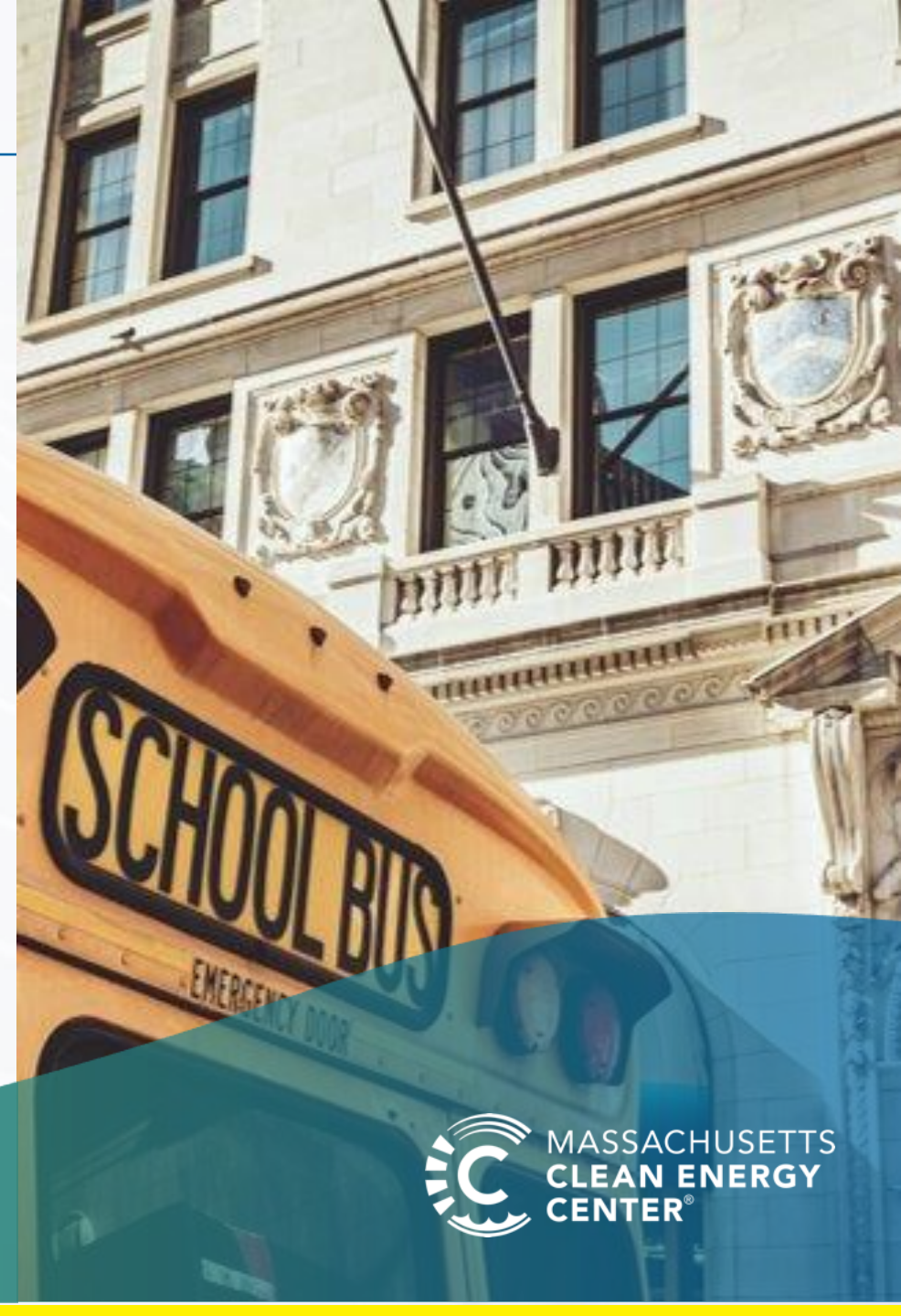


May 18, 2023

School Bus Electrification:

MassCEC Funding Opportunities



Massachusetts Clean Energy Center

**High
Performance
Buildings**



**Clean
Transportation**



**Net Zero
Grid**



**Offshore
Wind**



**State economic and development agency that seeks to
accelerate Massachusetts' clean energy and climate goals**

Why Go Electric?

Electrification is the future:

- 20+ models available from all major manufacturers
- Quieter, better for the environment and the health of students & drivers
- Cheaper to maintain and fuel than a diesel bus

Why now?

- Federal and state funding opportunities
- Technology improvement in recent years
- Around 13K electric school buses committed or procured across the country



Barriers to Electrification

Upfront Costs:

- Electric school buses are 2-4 times the cost of a diesel bus
 - \$250 - \$400k
- Necessary charging stations + electrical upgrades add significant cost



Project Complexity:

- Multiple stakeholders – utility, 3rd party operators, vendors and OEMs
- New procurement processes, grant funding requirements
- Operational differences (charging vs. fueling)



Overcoming Barriers in the Commonwealth



Managing Upfront Costs

- ▶ Funding opportunities may cover the upfront cost of electric school buses and can help infrastructure upgrade costs
 - EPA, MassCEC funding
- ▶ Turnkey and electrification-as-a-service options

Breaking Down Project Complexity

- ▶ Talk to utilities early and look for programs like Make-Ready
- ▶ Technical Assistance from vendors, manufacturers, the World Resources Institute, MassCEC
- ▶ Turnkey and electrification-as-a-service options

Frequently Asked Questions



Range and Cold Weather



Operational Savings



Safety and Driver Experience



Where to Start



Range and Cold Weather



What is the actual operational range of an electric school bus?

- ▶ "80 miles on a single charge is a safe bet. 100+ miles if you do everything perfectly"
 - ▶ Source: operators (including a 200+ electric school bus fleet in Canada), school districts, manufacturers
- ▶ Type C ESBs have a range of up to 210 miles!
 - ▶ Source: WRI Electric School Bus Initiative

Can ESBs operate in cold weather?

- ▶ Yes! deployments in Canada (80 mile routes), Alaska, Maine, Massachusetts, upstate New York and Vermont (75 mile routes)
- ▶ Efficiency decreases by 20 – 50% due to cabin heating & battery performance, but adequate planning and driver behavior will mitigate
- ▶ Cold start is less of an issue than in diesel buses



Operational Savings

Do electric school buses actually save money over time?

- ▶ Yes! After the upfront cost, electric school buses could save districts an estimated **\$4,000–\$11,000** per school bus per year on operational expenditures like fueling and maintenance and repair costs.
 - ▶ Source: WRI Electric School Bus U.S. Market Study and Buyer's Guide

How long do batteries last?

- ▶ 8 to 10 years – warranties available from manufacturers



OILS/FILTERS/
LUBRICANTS



AFTER TREATMENT
COMPONENTS



Safety and Driver Experience



What is the training like for drivers of electric school buses?

- Straightforward and similar to driving diesel buses
 - Learning curve with acceleration and breaking
- Manufacturers often offer training
- Consistent positive feedback from drivers - smoother and quieter drive

Are there different safety concerns?

- Safer for public health
- Potential for integrated sensors and controls for increased driving safety
- Newer models have bigger side windows to reduce blind spots
- Batteries go through rigorous testing for fire safety and fire risk on EVs is lower than with traditional ICE vehicles



Where to Start

World Resources Institute (WRI)

- [Electric School Bus Market Buyer's Guide](#)
- [Electric School Bus Sample Pitch Deck](#)
- [Request for Proposals \(RFP\) Template](#)

Joint Office of Energy and Transportation

- Provides technical assistance to school districts to plan for and deploy clean school buses in their communities.



WORLD
RESOURCES
INSTITUTE



Joint Office of
**Energy and
Transportation**

ACT School Bus Offers:

FLEET DEPLOYMENT PROGRAM

- ▶ Up to \$2.5M in flexible funding available for 2 school bus fleets.
- ▶ Optional technical assistant to guide the EV bus deployment process
 - ESB charging station planning, infrastructure deployment, and data collection

Application Opens Sep 2023

ADVISORY SERVICES PROGRAM

- ▶ Free electrification planning for up to 25 school bus fleets.
- ▶ Includes preparation for districts to access additional or future funding opportunities
 - Feasibility designs, financial models, procurement plans

Currently Recruiting

Deployment Program – Upcoming

- ▶ MassCEC is expects to provide **\$5M** in funding to complement federal EPA electric school bus grant program
 - [Notice Of Intent](#) available on our website

- **Eligibility:**

- Mirroring EPA's eligibility
- Public School Districts

- **Prioritization:**

- EPA awardees
- EJs

Expected Timeline:

Release of NOI	May 2023
Release of RFP	September 2023
Webinar hosted by MassCEC	October 2023
Proposals Due	Latest January 2024

*subject to change at MassCEC's discretion

Deployment Program – Current Projects



- ▶ **ACT School Bus Deployment Program (MassCEC)**
- ▶ MassCEC is currently providing **\$9,480,490** in funding to complement federal EPA electric school bus programming
- ▶ 6 Massachusetts public school districts supported by 2022 ACTSB Deployment funding:

Fall River

\$2M to deploy 11 buses

Lower Pioneer Valley Educational Collaborative:

\$2M to deploy 25 buses

Lawrence:

\$1.7M to deploy 10 buses

New Bedford:

\$2M to deploy 4 buses

Quincy:

\$355K to deploy 4 buses

Upper Cape Cod Technical Regional School:

\$1.5M to deploy 2 buses

ACT School Bus Advisory Services

➤ Free Fleet Electrification Planning Program

- Support for up to **25** school bus fleets
- Includes preparing districts to access additional funding opportunities
- Feasibility designs, financial models, procurement plan

➤ Advisory Services can help answer questions like:

What infrastructure changes should be made to bus depots?

What other funding opportunities are out there?

What are key areas for costs and savings?

What are the best charging options?

Which routes are best fit for early electrification?

Advisory Services – Eligibility and Prioritization

- School districts OR 3rd party school bus fleets (in partnership with school districts) may directly apply to receive free electrification advisory services
- EPA Priority Districts and 3rd party school bus fleets partnered with Priority Districts will be given preference in enrollment
- Goal of geographic and ownership model diversity

Each of the 25 school district fleets will receive a customized fleet electrification plan and hands-on assistance from a team of experts

MassCEC is Here to Support You!



- Please submit questions to: CleanTransportation@masscec.com

- ACT School Bus Opportunity:
 - [ACT School Bus Landing Page](#)
 - [ACT School Bus Advisory Services Interest Form](#)

- Contact us directly: OStrobel@masscec.com
- Sign up for our [office hours](#)

- Don't hesitate to reach out!