ELECTRIC SCHOOL BUSES ARE ROLLING

INNOVATION WEBINAR
April 25, 2024
3:00 - 4:00 p.m. ET
About NARUC

• Founded in 1889, the National Association of Regulatory Utility Commissioners (NARUC) is a non-profit organization dedicated to representing the state public service commissions who regulate the utilities that provide essential services such as energy, telecommunications, power, water, and transportation.

• NARUC's members include all 50 states, the District of Columbia, Puerto Rico, and the Virgin Islands.

• Our mission is to serve the public interest by improving the quality and effectiveness of public utility regulation.
About CPI

• The NARUC Center for Partnerships & Innovation (CPI) builds relationships, develops resources, and delivers training to assist state commissions contending with complex current and emerging issues.

• CPI is funded by cooperative agreements with the U.S. Department of Energy (DOE) and the U.S. Department of Commerce’s National Institute of Standards and Technology (NIST).

• NARUC CPI conducts work across five key energy areas and many topics within each: generation; transmission; distribution; customers; and critical infrastructure preparedness, response, and resilience.

• For more information, visit: https://www.naruc.org/cpi/cpi-home/
Upcoming Events

Virtual Events:
• EV State Working Group Webinar – April 28
• Workshop 3: Integrated Distribution System Planning for ADERs – May 1
• Improving Energy Resilience with Rural and Remote Microgrids – May 7
• April Innovation Webinar on electric school buses – April 25
• Regulators’ Roundtable: Resource Planning and Regulatory Considerations Amidst the Energy Transition - Part 1 – May 16
• Innovation Webinar on TBD topic – May 30

In-Person Events:
• Mid-Atlantic regional energy equity workshop – May 6 – 8, Washington, DC
• Coal & carbon management site visit – June 26 – 28, Gillette, WY
Electric School Buses are Rolling

Moderated by:
Commissioner Davante Lewis, Louisiana Public Service Commission
Electric School Buses: How Utilities & Regulators Can Maximize Grid Assets

April 2024
At WRI’s Electric School Bus Initiative, we aim to:

- 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
Electric school buses are committed in nearly all states, on the road in 47 states, DC, 4 territories and several tribal nations have committed electric school buses.

- 49 states, DC, 4 territories and several tribal nations have committed electric school buses.
- 47 states have delivered or operating ESBs.
There are 3,867 electric school buses on the road today - nearly 1% of the fleet.
$9B+ in Public Funding for ESBs

PLUS:
- Federal tax credits
- Additional federal funding
- Greenbank and financing

Also a growing number of utility make ready programs and other support
States have begun to adopt zero-emission fleet transition targets

100% of all school buses must be electric by 2040 (2030 for environmental justice communities)

- 6 states have statutorily-enacted zero-emission transition mandates
- 2 states and Washington, DC have non-binding zero-emission transition goals
- 11 states have adopted the Advanced Clean Trucks (ACT) rule; 2 other states are actively considering ACT
- Around 142,700 school buses (30%) and 7,341,000 school bus riders (40%) are impacted by a transition goal or the ACT rule

Electrification policies by state

Number of statewide commitments: 0, 1, 2

ACT requires manufacturers who produce medium- and heavy-duty vehicles (including school buses) to sell zero-emission vehicles as an increasing % of their annual sales from 2024 to 2035.

Has binding transition goal
No
Adopted ACT rule?
ESB INITIATIVE RESOURCES

“Why Electric School Buses?” sample pitch deck

Electric school bus battery resources hub

All About Operating Electric School Buses in Cold Weather

ESB Initiative Equity Video Series

8 Things to Know about Electric School Bus Repowers

Electric School Bus technician training database

Electric school bus US Market Study and Buyer’s Guide

Clearing the Air on Emissions from Propane-Burning School Buses
ESB INITIATIVE RESOURCES

All About Total Cost of Ownership (TCO) for Electric School Buses

Clearinghouse: Electric School Bus Funding and Financing Opportunities
ESB INITIATIVE DATA DASHBOARD

electricschoolbusinitiative.org/electric-school-bus-data-dashboard
COLD WEATHER OPERATIONS

ESBs successfully operate in cold climates across North America, and have nameplate ranges up to 210 miles.

With proper planning & adjustments, ESBs perform better than diesel-burning buses in snowy conditions.

New technology prevents cold weather from negatively impacting ESB batteries.

Source: All About Operating Electric School Buses in Cold Weather
COLD WEATHER OPERATIONS TIPS

Pre-condition
Warming up the battery & cabin before routine trips

Storage
Keeping school bus indoors improves overall operation

Mid-Day Charging
Allows for faster charge when school bus is warm from afternoon route

Route Planning
Drive ESBs on least demanding routes during first winter of operation

Charger Weatherproofing
Keep charger safe in extreme cold, snow and ice

Training
Drivers should know how to operate ESB in cold weather

Source: All About Operating Electric School Buses in Cold Weather
The Alliance is a diverse coalition of not-for-profit organizations committed to an equitable transition of the nation's school bus fleet to electric models.

Our goal is to ensure this transition prioritizes the highest-need school districts in the most polluted areas -- which, as data shows, are disproportionately low-income communities and communities of color -- while creating good-paying careers for U.S. workers.
OUR MEMBERS
Electric school buses are assets to the grid.

Predictable schedule can help manage loads on the grid

Buses can provide vehicle-to-grid or vehicle-to-building services during peak demand (like hot summers in Massachusetts or emergencies (such as heat waves in California), making communities more resilient

Potential revenue for operators
Utilities and regulators play a crucial role.

- providing electricity service
- planning and constructing infrastructure
- advising fleet operators
- connecting and servicing charging stations
- rate design and cost recovery proposals
- V2G + resiliency
- education on ESBs
- funding applications
Here’s how utilities and regulators can support school bus electrification.

- **Including ESBs in utility and NEVI plans**
- **Make-ready & incentives**
  - at least 50% and up to 100% of funding for communities most harmed by transportation pollution
  - costs recovered without raising rates on those who can least afford it
- **Technical assistance and fleet advisory services**
- **Equitable, fair rates for electric school bus charging**
  - time-of-use rates
  - demand charge holidays
- **Culturally- and linguistically-appropriate community engagement as part of equitable utility programs**
- **Grid services (V2X pilots) and programs, with benefits targeted to impacted communities**
Challenge

In some cases, school bus fleet operators applying for federal funding are struggling to connect with utilities.

- Need to speed up conversations between utilities and fleet operators.
  - EEI has partnered with EPA to help connect school districts with their utility.
  - EPA requires CSBP applicants to attest to engaging with their utility.
  - EPA has resource on Coordinating with Electric Utility Partners for CSBP applicants.

- Great starts! More is needed.
Potential Solutions

Speeding up connections between utilities and fleet operators.

(Pre-Grant) Fleet Advisory Solutions

- Utilities could establish teams to handle new fleet electrification customers who are applying for funding.
  - Identify one account manager
  - Conduct proactive outreach
  - Guide fleet operators in understanding: site capacity, charging options, interconnection estimates.

- Utilities could also request fleet electrification plans from fleets.
  - If fleets don’t have them, utilities help create them and ensure right sized charging.
Challenge

School bus fleet operators that have secured federal funding are experiencing delays.

• Need strategic build out of infrastructure to meet oncoming federal momentum.
Potential Solutions

Planning ahead for school bus fleet infrastructure needs.

(Post-Grant) Fleet Advisory Services

- Utilities should conduct site visits, engineering analyses, infrastructure planning.
- Utilities should also include ESBs in their long-term plans and build for the coming load.
  - Prioritize where ESBs are committed -- states with transition requirements, school districts already committed to ESBs. “No regrets” investments.
There has never been a better time to invest in a #CleanRide4Kids
THANK YOU

www.electricschoolbusinitiative.org
Rolling Right: Supporting Effective ESB Adoption in NC

Jacob Bolin
Electric Transportation Specialist
Advanced Energy
About Advanced Energy

Advanced Energy is a nonprofit energy consulting firm. We work with electric utilities, government and a wide variety of private organizations in the residential, commercial and industrial, renewables, motors and drives, and electric transportation markets. Our customized services include research, testing, training, consulting and program design.
Our Role in Supporting Electric School Buses

• Outreach and Education
  • Plug-in NC
• Technical Support
  • Infrastructure Planning
  • Utility Program Support and Evaluation
  • V2G Test Plan Design and Implementation
An Idea of Scale: Still at the Bus Stop

• Currently fewer than 25 electric school buses across the state

• Approximately 100 awarded through:
  • VW Settlement Programs (two phases)
  • EPA Clean School Bus Program
  • Duke Energy Pilot

• 15,000+ total buses in NC

• AE focused on how to get electric school buses to work best for utilities
Anecdotes From the Field

• Today’s electric school bus projects require a lot of partners — choose wisely

• We must lighten the load for our educators

• Buses have enough capacity to meet necessary range requirements
  • Typically starting charging sessions above 50% SOC

• V2G use case can pencil out
  • Buses have enough SOC after routes to discharge for grid/demand services
  • Technology still needs some work

• Managed charging isn’t happening yet, but it is critically important
  • Building confidence with charging sessions
  • Overcoming driver range anxiety
  • Understanding charging schedules & unique needs
Managed Charging Checklist

- EVSE properly sized and reliable? Flawless connectivity with bus?
- Software to track station usage and behavior? Who punches the buttons?
- Visibility for charging performance over time?
- Practice over the summer? 100x?
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Supporting EV Infrastructure Needs

Is your organization prepared to support the increased demand for EV infrastructure? There is a lot to consider when installing charging stations, including how many, what type, their location, networking capabilities, maintenance plans, policies and more.

Planning well for your current and future needs can save you money and time and decrease interruption to your business. **We offer a customized approach to planning for EV charging, including working to help you identify and secure rebates and incentives for your project.**

Whether it’s charging for your fleet vehicles or employees, we will provide you with expert support to get the most out of your journey into electric transportation infrastructure.

Learn More
Plug-in NC: Success Stories and Resources
Thank You

www.advancedenergy.org
919-857-9000
Electric School Bus Fund

Eva DeCesaro, Portland General Electric
April 2024
Portland General Electric

Powering Oregon's clean energy future.

Serving 2 million people in 51 cities
Grant Funding for the incremental cost of Electric School Bus and initial funding for chargers and make ready. To-date the ESB fund has supported 50 electric school buses in Oregon.

**ELIGIBLE EXPENSES**
- Incremental cost of an electric school bus
- Charger and any add-on features (cellular connectivity, cable management, etc.)
- Charger’s network software fees and maintenance plan

**INELIGIBLE EXPENSES**
- Fuel costs (i.e. electricity)
- Vehicle or driver insurance costs
- Bus maintenance or extended warranty costs
- Site costs not directly required for electrification (e.g. onsite renewables, energy storage, landscaping)
The Electric School Bus Fund is not funded through ratepayer sources. It is completely funded through PGE’s participation in the Oregon Clean Fuels Program (CFP). This is a statewide low carbon fuel standard that is administered by the Oregon Department of Environmental Quality.

The Oregon CFP mandates a decrease in the carbon intensity of transportation fuel

PGE earns credits using a calculation of EV charging at customer residences

+ More EVs = More Credits

PGE sells credits to importers of diesel and gasoline
Lessons Learned

Champion Needed
Districts have competing priorities. Finding a community champion makes all the difference in making the leap to electric.

Technical Assistance
In the planning stage districts have a lot of questions. They need tools and often multiple conversations before committing.

Transportation First
Electric school buses need to fulfill their primary role of student transportation ahead of emerging grid services.

Flexibility
The market continues to evolve rapidly, especially as new technologies and additional funding opportunities emerge, approach needs to evolve too.