Clean Transportation Communities of Southern Connecticut

CONNECTICUT ENERGY & ENVIRONMENT

CONNECTICUT GREEN BANK

Save the Sound
Action for our region's environment.

HOW PURA'S DECISION WILL IMPACT SCHOOL BUS ELECTRIFICATION IN CONNECTICUT

SEPTEMBER 18TH, 2025

Agenda & Panelists

Welcome & Introductions	Opening remarks and overview of today's session
Dan Ciarcia, CTC	CTC's Electric Power Capacity Report: Real World Implications
Kevin Moss, CT Green Bank	Overview of PURA Docket 21-09-17 & the Green Bank's Fleet Electrification Acceleration Program
Charles Rothenberger, Save the Sound	What's the Matter with Diesel? An Overview of Emissions, Policy, and Health Implications of Diesel
Paul Kritzler, CT DEEP	State Funding Opportunities For Electrification
Q&A	Where do we go from here?

Clean Transportation Communities of Southern CT (“CTC”)

- One of three coalitions in CT and 80 across the country, funded by US DOE to accelerate the adoption of clean fuels in transportation.
- CTC serves New Haven, Middlesex & New London Counties
- “Boots on the ground” for DOE’s alternative fuels program
- Add value by being an intermediary between fleets and state and federal policy, and between fleets and new technologies/innovators.

CTC Electric School Bus Work To Date

- Directly working with school districts across the three counties
- Collaborating with state and federal policymakers to address opportunities and challenges in school bus electrification
- Supporting districts in navigating the state mandate to electrify by 2030 for districts containing Environmental Justice Communities (EJCs) and by 2040 for all other districts
- Assisting school districts with the EPA Clean School Bus Program, from planning applications to navigating post-award challenges
- Workforce Development – Workshops for school district staff on school bus electrification, and training for First Responders on EV fire preparedness (in partnership with the National Fire Protection Association)

Real-world Study – CTC's Electric Power Capacity Report: Implications for School Districts

Dan Ciarcia

Consultant, Clean Transportation of Southern Communities

Electric School Bus (ESB) Charging Capacity Analysis

Daniel Ciarcia

Sustainability Consultant

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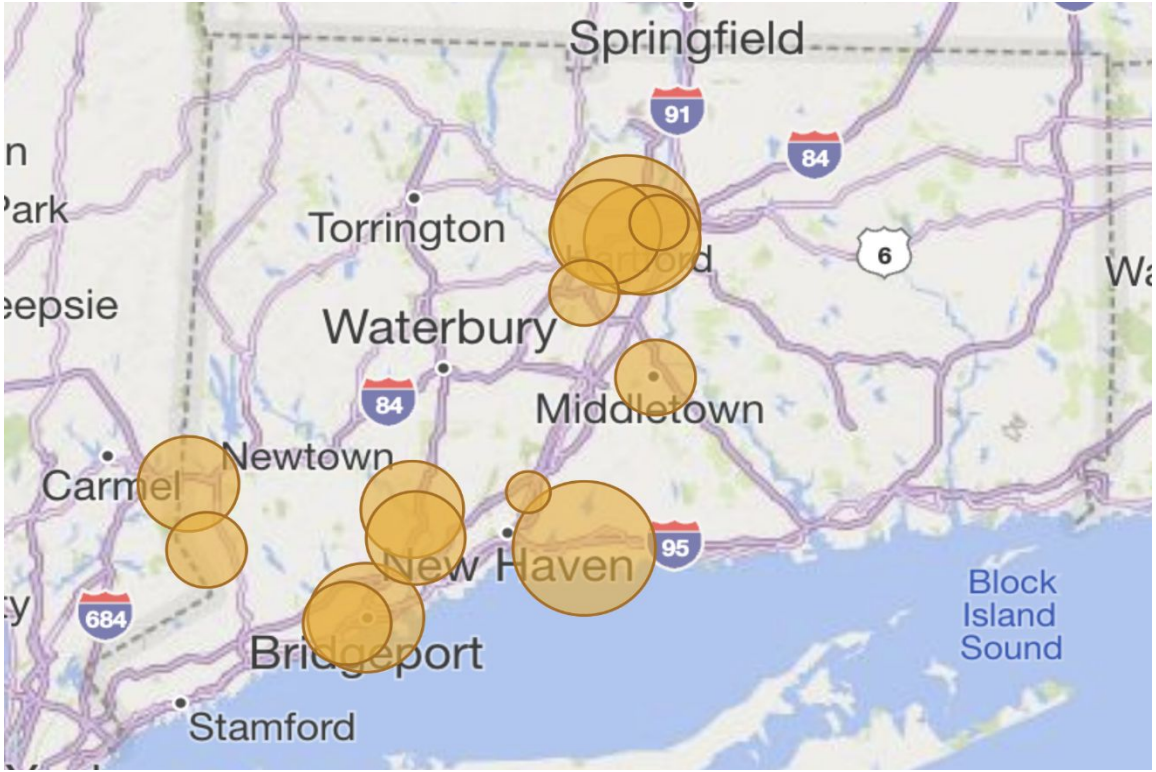
Clean Transportation Communities – ciarcia@nhcleancities.org

Clean Transportation Communities of Southern Connecticut

ESBs Are Here !!

- 247 orders committed
- 70 delivered or operating
- 3,800 students experiencing benefits



Credit: WRI ‘Electric School Bus Data Dashboard’

Why the movement?

Clean Transportation Communities of Southern Connecticut

Benefits

- Zero emissions (healthier)
- Lower system environmental impact (climate change benefit) 65-75% reduction in GHG
- Lower noise (20 dB lower)
- Lower operating and maintenance expenses (lower TCO)
- Superior performance

Challenges

- High vehicle purchase cost
- Typically contracted out in CT (bus operator leases)
- Charging infrastructure required
- Electric grid capacity could be constrained

Clean Transportation Communities of Southern Connecticut

Project Goals

- Assess the charging readiness levels in CT for school bus electrification
- How much capacity is needed to deliver enough power to fully electrify school buses in CT's school districts?
- Focus on New Haven, Middlesex and New London Counties with real-world data
- Inform decision makers in school districts, policy makers and planners on their electrification readiness to eliminate this unknown

Methodology

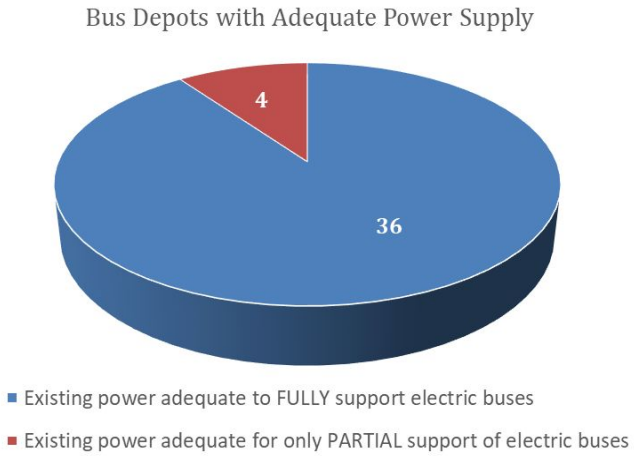
- Determine **demand** with direct district data on existing bus fleet and usage patterns
- Determine current electrical **supply** by outreach to utilities and public information
- **Analyze** (by district) the capability at each bus depot to charge with the existing capacity

Assumptions

- 85 miles for any districts who didn't provide route data
- 1.5 kWh of electricity per mile travelled
- Each bus has a dedicated Level 2 19.2 kW Charger
- 10 hours of dwell time (overnight in the depot)

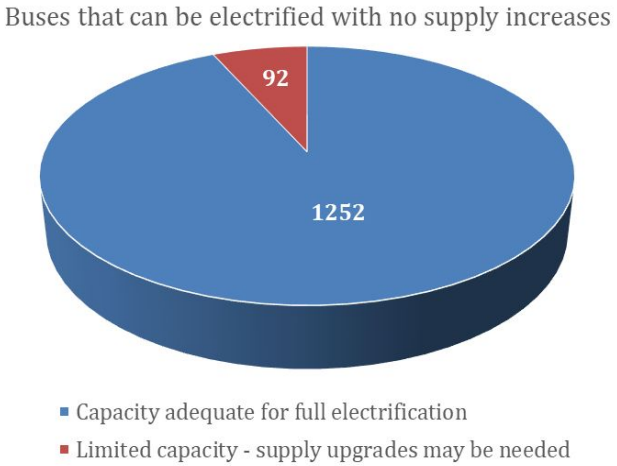
Remarkable Results!

- Two-thirds (40 out of 60) of the districts provided the full data that we requested
- These 40 districts house 2,104 Type C buses, and smaller school buses, vans, averaging 13K+ miles/year (New Haven)
- **90% (36 out of 40 respondents) have sufficient power capacity to fully electrify**
    - 34 of these districts can charge all buses simultaneously
    - 2 of these districts would need smart charging to efficiently schedule the charging sessions (New London and Regional 13 - Durham & Middlefield)



Only small gaps in charging capacity

- **The four districts with insufficient capacity could still electrify more than half (92 out of 174 buses) of their collective fleet**
  - Middletown could electrify 31 out of 42 (75%)
  - Norwich could electrify 31 out of 55 (57%)
  - Regional 04 (Chester, Deep River, Essex) could electrify 16 out of 48 (33%)
  - North Haven could electrify 3 out of 29 (11%)
- In total, across the 40 districts, **93% of the buses can be electrified** (1252 out of 1344) with no grid capacity upgrades
- **Many strategies are available** to increase charging further
  - School yard charging, weekend charging, staggered dwell time, longer dwell times, on-site generation, satellite depot location



Other charging considerations

- EV charging levels & features (i.e. smart charging)
- Local power generation (i.e. solar PV arrays)
- Electricity Demand Charges
- Vehicle-to-Grid (V2G) - additional revenue source
- Regulatory & Policy requirements

Next steps - reach out to your utility, discuss this with your bus operator, work with EV advocacy groups

Come talk to us at CTC – we are here to help!

Overview of PURA Docket 21-09-17 & the Green Bank's Fleet Electrification Acceleration Program

Kevin Moss

Senior Manager for Clean Transportation, CT Green Bank

Clean Transportation Communities of Southern CT

September 18, 2025

CONNECTICUT GREEN BANK

Discussion Topics

PURA MHD-EV Decision Overview

- Infrastructure Incentives
- Charging Rates
- Fleet Advisory Services

Takeaways, Planning, & Investment Opportunities

Our Goals

CONNECTICUT GREEN BANK®

Leverage limited public resources to scale-up and mobilize private capital investment in the green economy of Connecticut.

Pursue investment strategies that advance market transformation in green investing while supporting the organization's financial sustainability goals.

Strengthen Connecticut's communities, especially vulnerable communities, by making the benefits of the green economy inclusive and accessible to all individuals, families, and businesses.

PURA Docket No. 21-09-17

Full Docket Title: PURA Investigation Into Medium and Heavy-duty Electric Vehicle Charging

Final Decision Link

Priority Vehicles

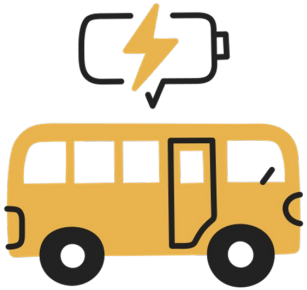
1. School Buses and Transit Buses
2. Last Mile Delivery Fleets (beverage trucks, delivery vans and trucks, etc.)

Decision Focus Areas

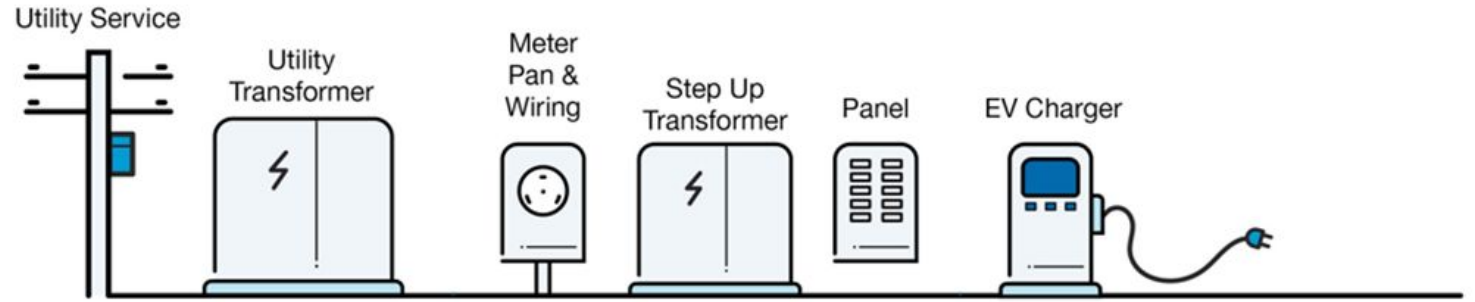
3. “Make-ready” Infrastructure + Charging Station Incentives
4. Rate Structures for MHD EVs
5. Fleet Advisory Services

Program Administrator

- To be determined



Make-ready Infrastructure



Eligible for EV Charging Program Incentives

Not Eligible

- Customers may be required to pay for grid upgrades in excess of utility's design requirements or business policies

- Panel
- Conduit
- Trenching
- Design
- Permitting

- Step Up Transformers
- Wiring
- Customer Switchgear

- Charging Station
- Networking

- Station Installation
- Signs
- Bollard
- Maintenance

Utility Constructs

Customer Constructs

Infrastructure Incentive Structure

Pilot Structure and Availability

- Up to four demonstration project sites
  - 2 in Eversource service territory
  - 2 in UI service territory
- Projects must be in “disadvantaged” communities *(definition TBD)*
  - Projects will likely need to be in school districts affected by the 2030 zero-emission school bus deployment requirement in P.A. 22-25 (full text, summary)

Make-ready Infrastructure:

- $1300/kW for up to 3 MW of capacity per site
  - Ex: Ten, 30 kW chargers = 300 kW of capacity x $1300 = up to $390,000
- Eligible uses include both customer and utility-side costs

EV Charging Stations:

- Up to 50% of charging station hardware costs, up to $400,000 per site

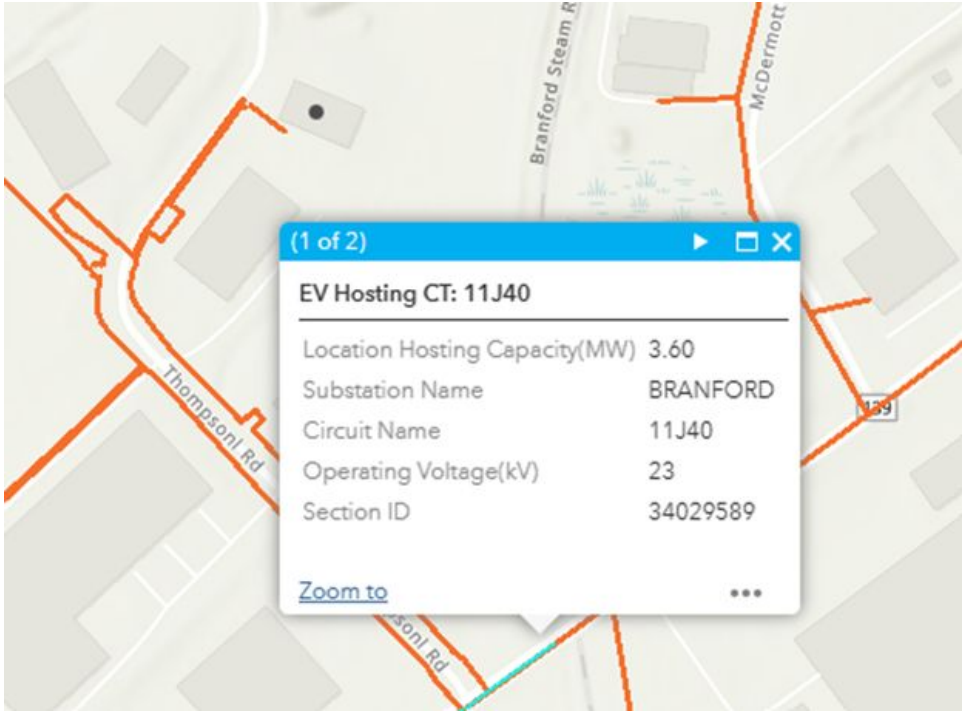
Electrification Plan Requirement

- Must demonstrate an electrification plan (either via Accelerator or independent)

Hosting Capacity Maps

[Eversource Link]

[UI Link]



“Scenario One” Rate

Key Utility Bill Components

- Volumetric: amount of electricity consumed (kWh)
- Demand Charges: peak demand of electricity consumption (kW)
- Transmission (NE-ISO) and Distribution-level (Eversource/UI) delivery charges

Rationale for a Custom Rate

- Certain technologies (EV fast chargers, stadium lights, etc.) use electricity quickly, but don’t necessarily consume much electricity per month
  - Demand charges affect their average price ($/kWh) more on a relative basis
- Tethering pricing to vehicles’ charging patterns is needed for market development

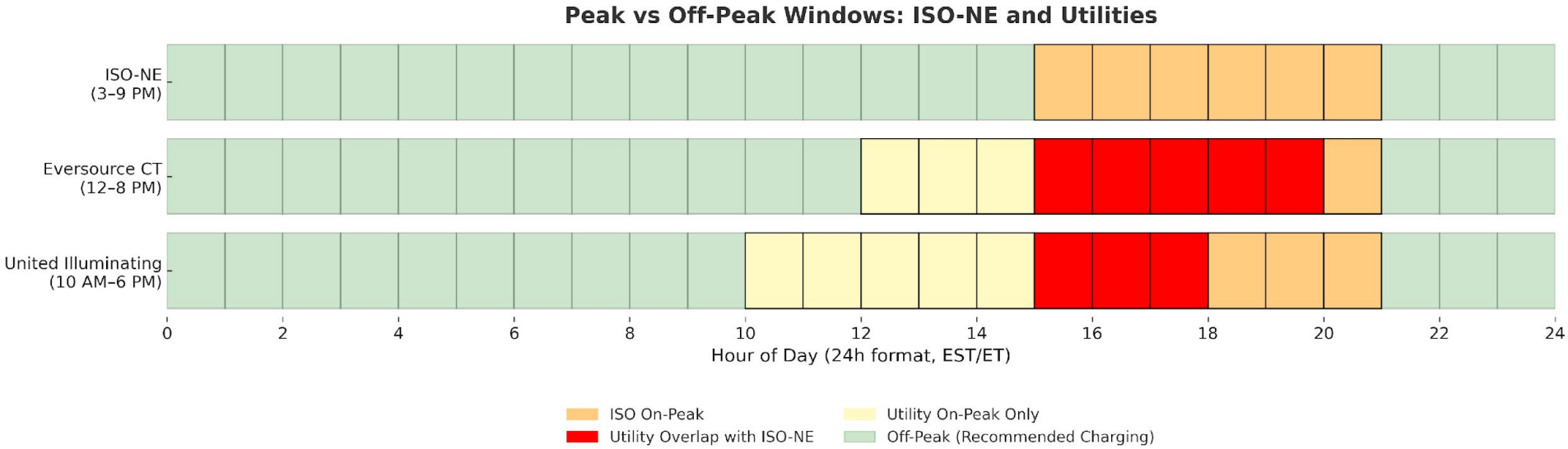
Load Factor

- A proxy for electricity consumption predictability and demand stability
- Calculation: highest kW demand in month/max theoretical kWh use * 100%
- Billing components are based on load factor tiers (0-7%, 7-14%, etc.)
  - No demand charges in the 0-7% tier (but high volumetric charges)

Time-of-Use Rates

- Lower rates can be accessed by charging during “off-peak” hours

Time-of-Use Planning



Charging Options, Projected Costs

Timeline

- The “Scenario 1” rate will become available no later than January 1, 2026
- Until then, MHD-EV fleet operators can enroll on corollary light-duty EV rates
  - Eversource: EV-S, EV-M, EV-L
  - UI: GS-EVSE, GST-EVSE

Load Factor Tiers

- On “Tier 1” for “slow start” period: one full calendar year + additional operating months
  - No demand charges while on “Tier 1” (0-7% load factor tier)
  - An electric school bus fleet that launched in August would be on “Tier 1” for 17 months to gather data
    - A new load factor tier would then be assigned for Jan-Dec
- Volume charges decrease and demand charges increase as load factor tiers increase

Projected Savings

- Approximately 40% average cost savings versus “business-as-usual” rate options
  - 45+ to 22-28 cents per kWh
- Early data validates these projected savings

Operating Cost Outputs, $/mile, $/year		
ESB Fleet	*$/mile*	*$/bus/year*
Year 1 - Year 5	0.78	10,983
Year 6+	0.98	13,800
Diesel Fleet		
Year 1 - Year 5	1.00	14,071
Year 6+	1.31	18,437
ESB Annual Savings		
Year1 - Year5	0.22	3,087
Year 6+	0.33	4,637

Takeaways, Accelerator, Investments

Market Certainty

- PURA's Final Decision provides certainty on core market development factors:
  - Make-ready Infrastructure Incentives
  - Fleet Charging Costs
    - No demand charges for at least 12 months

Fleet Electrification Accelerator

- The Green Bank has been selected by PURA to implement a "Fleet Advisory Services" program focused on school bus electrification
- The fall pilot cohort and January 2026 cohorts are **free** for school districts and school bus operators located in CT Distressed Municipalities
  - Fall Pilot Cohort: CTECS, Preston Public Schools
  - January 2026 Cohort: actively recruiting!
- Planning to Investment pipeline development

Investments

- The Green Bank has been structuring "braided" funding investments in tandem with EPA and DEEP grant funds
- Green Bank funds offer concessionary rates and flexible terms and help implement grant dollars more easily

Fleet Electrification Planning

Vehicle and Charger Recommendations

One-to-one electric school bus and charger recommendations based current operations

District-Specific Road Map

A school district-specific Fleet Electrification Road Map that can be used in federal and state funding applications, including total cost of ownership analysis for each vehicle

On-Site Assessment

Evaluating capacity for chargers and infrastructure upgrades needed

Procurement Timeline

Short-and long-term plans for infrastructure upgrades, bus, and EVSE procurement

Funding and Incentives

Detailed descriptions and application instructions for available funding and incentive opportunities

Electric School Bus Basics

Everything you need to know to transition to electric school buses in easy-to-understand language

Deployment Support

Financial Analysis

Total cost of ownership, procurement plan, and analysis of available incentives

Stakeholder Analysis

Identifying stakeholder categories who should be engaged in electrification

Installation Support

Comprehensive infrastructure installation support, from early-stage planning to final commissioning

Construction and Commissioning Planning

Interconnection planning guide and continuous support to navigate the commissioning process

Workforce Development and Training

Identifying skill gaps, training and retraining needs, and providing training materials and recommendations

Investment Summary

Investments

- The Green Bank has been structuring “braided” funding investments in tandem with EPA and DEEP grant funds
- Green Bank funds offer concessionary rates and flexible terms and help implement grant dollars more easily

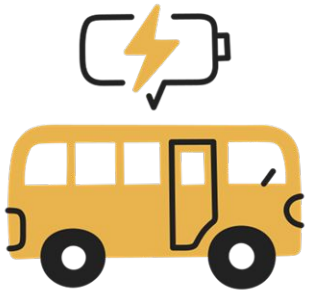
Project and Metrics	Approved Green Bank Investment	Federal Funds Leveraged	State Grant Bridge Loan	State EJ Community?	Federal LIDAC?	District Free and Reduced-Price Meals* %
Autumn, Hartford	$2.0 MM	$9.8 MM	$837k	Yes	Yes	78.5%
Dattco, East Hartford	$1.1 MM	$400k	$80k	Yes	Yes	60.9%
Zum, Branford	$12.3 MM	$11.3 MM	$1.84 MM	Yes	Yes	36.8%

*National and CT FRP Averages = 53.3% and 41.9%, respectively

Our Ask?

Get in touch! The Green Bank is here to support schools and their school bus operators

Email - kevin.moss@ctgreenbank.com



Save the Sound
Action for our region's environment.

What's the Matter with Diesel? An Overview of Emissions, Policy, and the Path to Electrification

Charles Rothenberger

Director of Connecticut Government Relations, Save the Sound

Save the Sound®

Action for our region's environment.

CONNECTICUT'S ELECTRIC MHDV PROGRAM

September 18, 2025

Charles Rothenberger

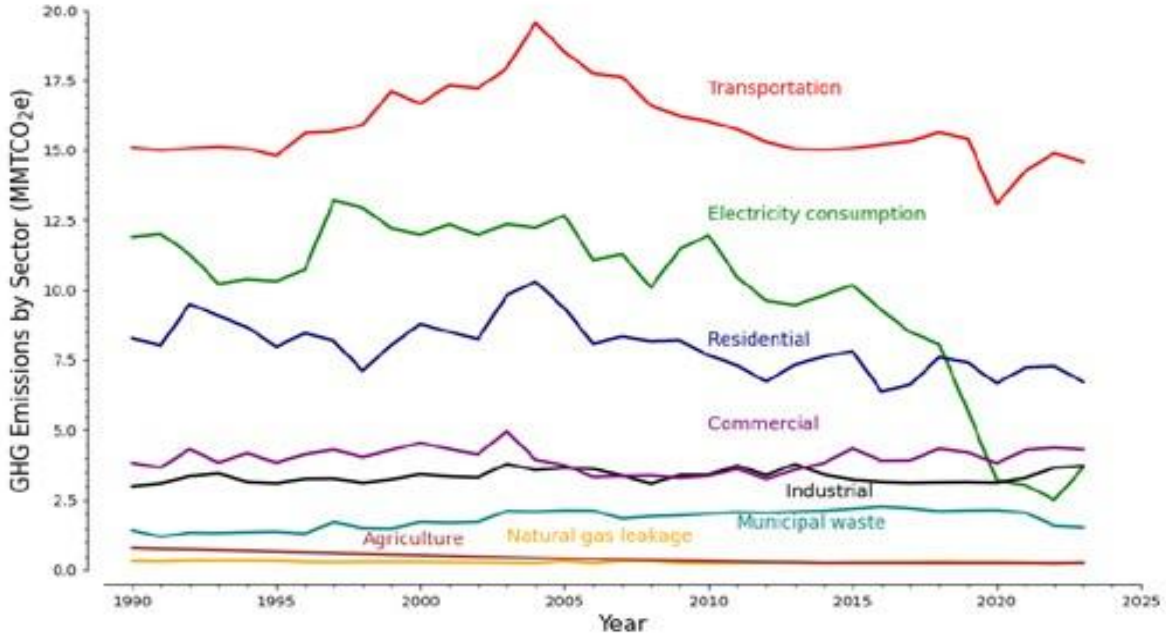
Director of Government Relations (CT)

PUBLIC POLICY GOALS

- CT Global Warming Solutions Act (2008)
  - Requires economy-wide GHG emissions reductions
    - 10% below 1990 levels by 2020
    - 45% below 2001 levels by 2030
    - 65% below 2001 levels by 2040
    - 80% below 2001 levels/Net Zero by 2050

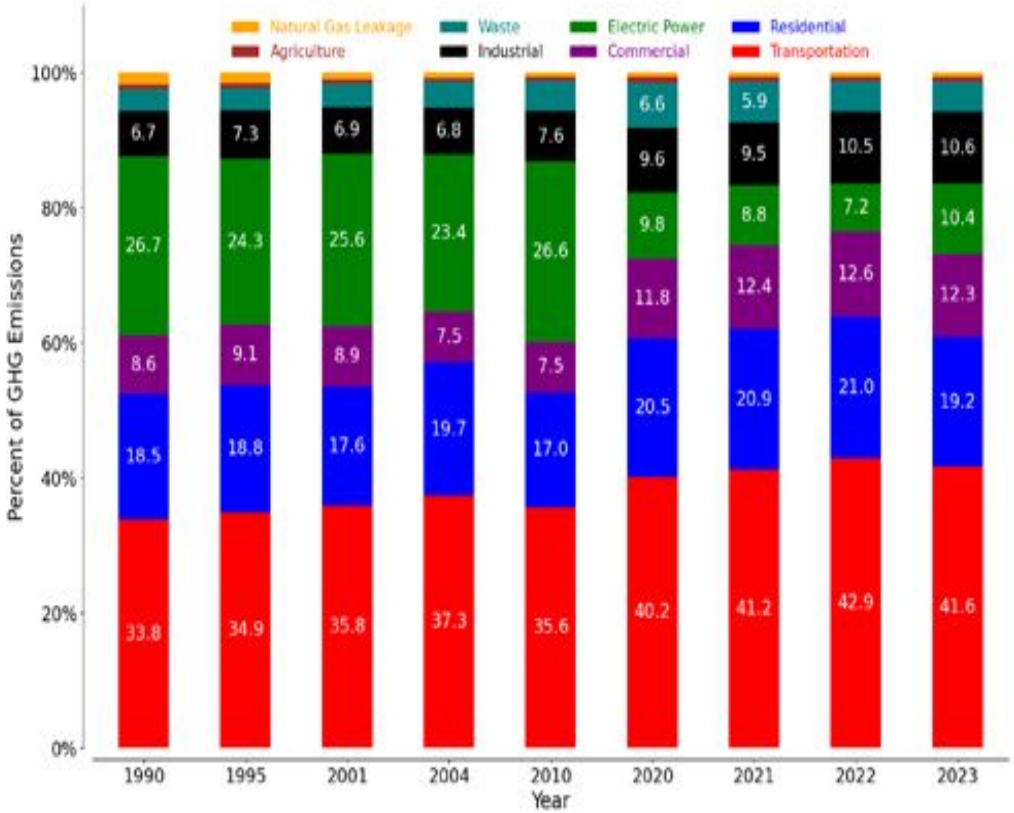
- Multi-State MHD ZEV MOU (2020)
  - 17 States, DC and Quebec
    - 30% MHDV sales by 2030
    - 100% MHDV sales by 2050

CT Emissions Inventories



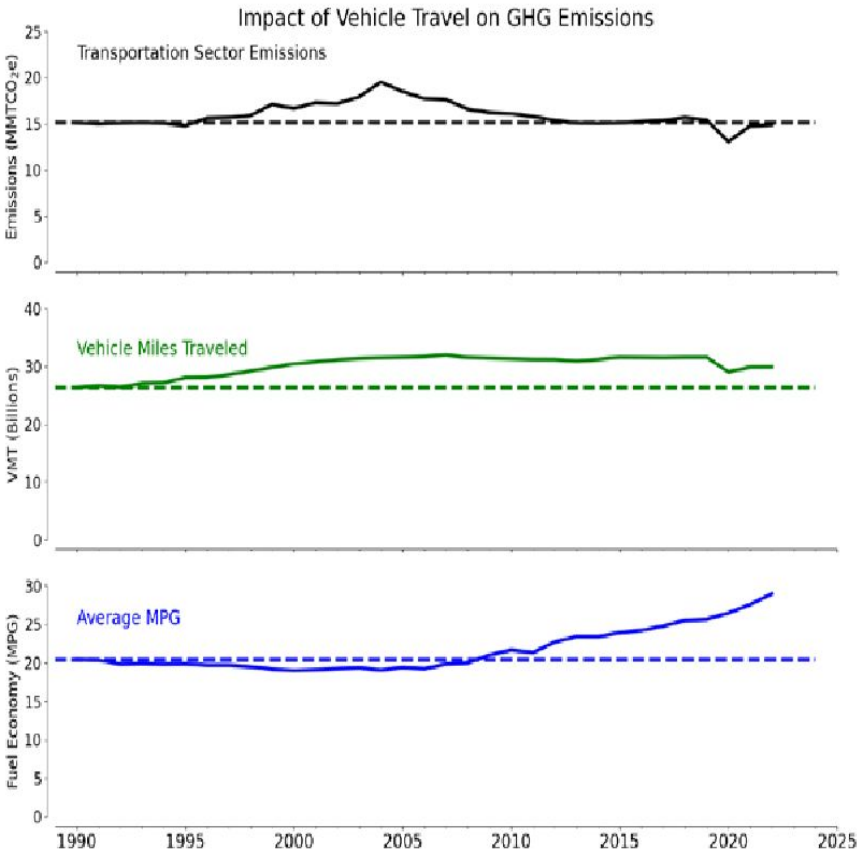
https://portal.ct.gov/-/media/deep/climatechange/1990-2023-ghg-inventory/deep_ghg_report_1990-2023-final.pdf?rev=c4562f29c0cd4dc4a43c7d67cfa83593&hash=B7E9F86289DCEFFCE0AAE1AA08637750

Source: CT DEEP



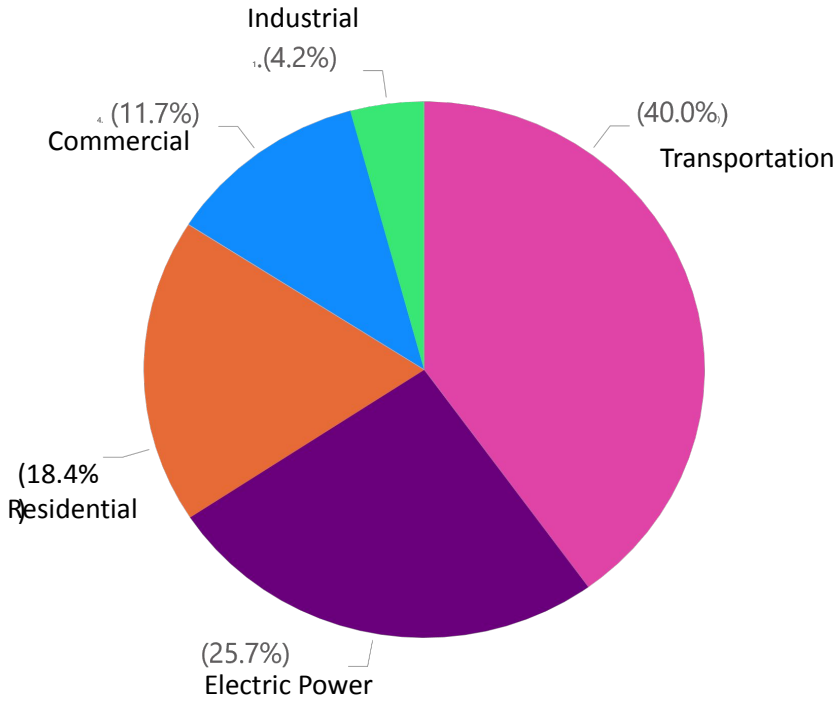
Relative contribution of each economic sector to Connecticut's total GHG emissions over time.

Source: CT DEEP



Source: CT DEEP

CT Emissions Inventories



M/HDV Share of Total On-Road Fleet	
Greenhouse Gas Emissions	25%
NOx Emissions	53%
PM Emissions	45%
Share of On Road Vehicles	6%

:
https://portal.ct.gov/deep/climate-change/ct-greenhouse-gas-inventory-reports?gad_source=1&gad_campaignid=22979562230&gbraid=0AAAAAouC9SLWQFEK4hl3JEwSd3FcpLcF5&gclid=Cj0KCQjwuKnGBhD5ARIsAD19RsY6DBiSjTsur8CrmASTkne6MNUZBqspgjzXd15RV44iT3hHdvaXPcsaAkEuEALw_wcB

Source: CT DEEP

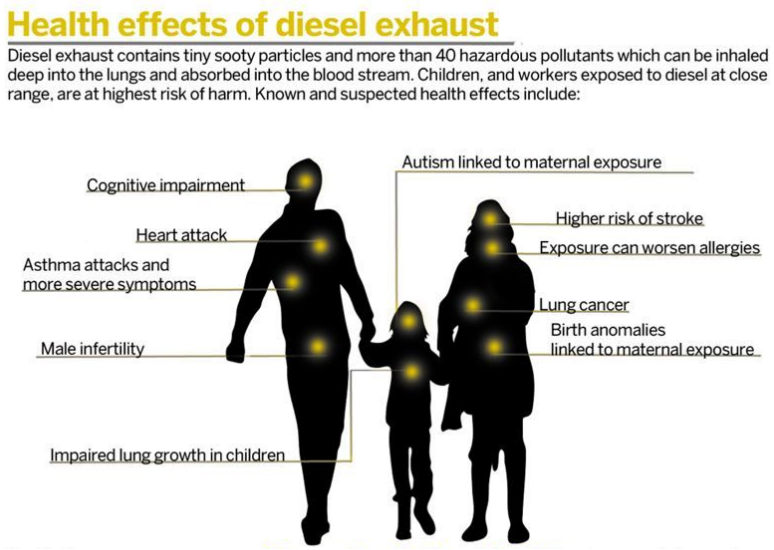
Electrifying for Healthier Communities

Diesel exhaust pollutants can lead to **asthma, cancer and other respiratory illnesses**.

Diesel exhaust pollution is a **known carcinogen**

There are **documented negative impacts** on both student health and academic performance – and there is increasing evidence that **children are particularly susceptible**.

Reducing students' exposure to air pollution from school buses has **positive and significant effects on some test scores**.



Sources: EPA; Beatty and Shimshack; Austin, Heutel and Kreisman; Liu and Grigg; WHO, Oregon PSR .

Public Act 22-25, An Act Concerning the Clean Air Act

July 1, 2022:	DEEP to establish a grant program to provide matching funds to municipalities, school districts, and school bus operators to support applications for federal funds for zero emission school buses and EVSE. **No specific date to have the program up and running.**
July 1, 2022:	DEEP may adopt regulations to implement the CA MHDV standards.
October 1, 2022:	School boards may enter into transportation contracts of up to 10 years, if the contract provides for at least one zero-emissions school bus.
January 1, 2023:	DEEP may establish a voucher program for the deployment of zero-emissions MHDVs (including school buses) and EVSE.
January 1, 2024:	DAS (& DOT) to submit report regarding: (1) Feasibility of establishing a competitive bid process for the aggregate purchase of fuel cell and battery electric LDVS and zero-emission buses and (2) A plan to implement zero-emission buses state-wide and barriers to implementation
January 1, 2024:	State ceases purchase or lease of diesel transit buses
January 1, 2030:	30% of buses purchased or leased by the state are zero-emissions
January 1, 2030:	100% of school-buses that provide transportation for school districts entirely within an EJ community or that encompasses at least one EJ community shall be zero-emissions school buses.
January 1, 2035:	100% of school-buses that provide transportation for school districts in the state shall be zero emissions or alternative fueled school buses.
January 1, 2040:	100% of school-buses that provide transportation for school districts in the state shall be zero-emissions school buses.

PURA DOCKET NO. 21-09-17

PURA Investigation into Medium and Heavy-Duty Electric Vehicle Charging

- Program objectives: 1. Develop MHD ZEV electrification offerings that support the state's statutory requirements and the commitment to the MHD ZEV MOU, prioritizing use cases where available funding and regulatory mandates aim to accelerate adoption; 2. Establish rate structure(s) and reporting metrics that facilitate the integration of existing, evolving, and emerging MHD ZEV-related technologies that encourage efficient grid utilization and flexibility, and balance ratepayer costs; 3. Establish a framework for deploying MHD ZEVs into Connecticut's electric grid that supports the integration of distributed energy resources (DERs), including potential storage solutions and the development of charging corridors, which are key components of meeting the objectives of the Authority's Framework for an Equitable Modern Grid; and 4. Enable an equitable transition to MHD deployment that prioritizes electrification in communities disproportionately impacted by pollution from fossil fuel emitting MHD vehicles and other disadvantaged communities.
- Final Decision (8/13/25)
- 5-year authorization
- MHD EV-specific rates will be offered to commercial and industrial customers to serve fleet EVSE.
- Charging Infrastructure Incentives
  - Available for 2 projects in each EDC territory for electrification of school buses in disadvantaged communities (located in or operate more than 50% of their mileage in disadvantaged communities).
  - Fleet Electrification Plan
  - Electrify at least 2 vehicles per project
  - Apply for all relevant state and federal funding opportunities
- Make-ready incentive: $1,300/kW (up to 3MW of capacity per site)
  - EVSE incentive up to 50% of the EVSE cost (up to $400,000 per site)
- Program Cost Estimates: $1,080,000 - $3,140,000
- Bill Impact Estimates:
  - Eversource: $0.042 - $0.122 (monthly); $0.51 - $1.47 (annual)
  - United Illuminating: $$0.190 - $0.551 (monthly); $2.28 - $6.62 (annual)

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State Funding Opportunities

Paul Kritzler

Supervisor, DEEP Air Bureau Toxics & Mobile Sources Office

CT DEEP CLEAN SCHOOL BUS PROGRAMS & PURA MHD

September 18, 2025
Paul Kritzler, Supervisor
Mobile Sources Group, Bureau of Air Management

THE THREE STAGES OF A CLEAN SCHOOL BUS PROJECT

Planning

- CGB Fleet Advisory Service
- World Resource Institute
- Third Party Resources
- The Municipality Next Door

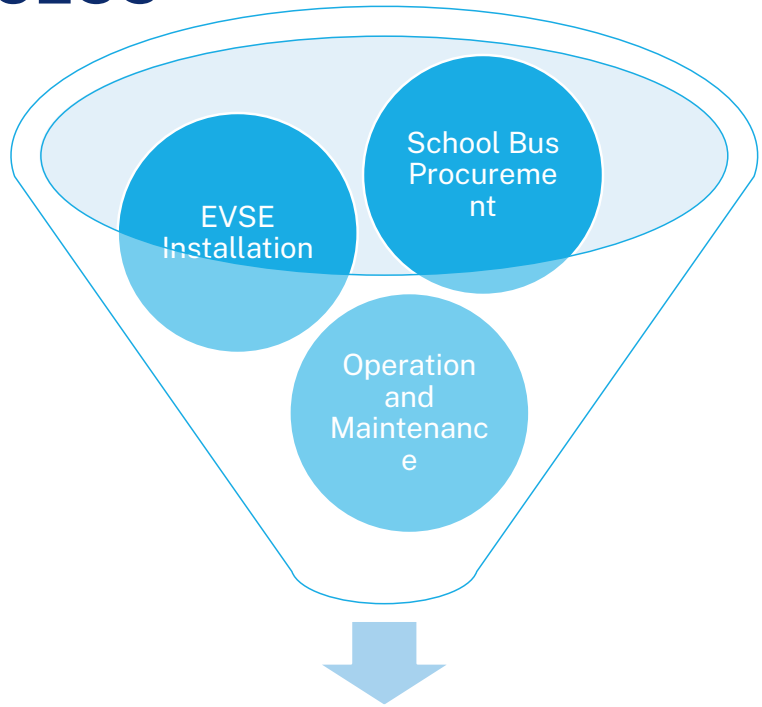
Procurement

- Federal Funding
- DEEP Funding
- CGB
- PURA Pilot Program

Operation

- PURA Rate Structure
- Workforce Development
- Reduced Maintenance Costs
- Happier Drivers
- Healthier Buses

CLEAN SCHOOL BUS PLANNING IS A COMPLEX PROCESS



How Do We Pay for All of This?

- CT DEEP DERA
- CT DEEP Volkswagen (Fall 25/Spring 26)
- CT DEEP CSB Bond Funding (Periodic)
- PURA Pilot Program
- PURA Rate Setting for MHD
- CGB Fleet Advisory Services
- CGB Funding
- EPA Clean School Bus ?!?

THREE STATE-LEVEL OPPORTUNITIES FOR CLEAN SCHOOL BUS FUNDING

- State Diesel Emissions Reduction Act (DERA) Funding
- Volkswagen (VW) Settlement Grants
- Connecticut Clean School Bus (CT CSB) Supplemental Grants

DERA REIMBURSEMENT

Reimbursement up to:

- 45% of the cost for vehicle replacement with electric equivalent
- 60% of the cost for replacement with electric engines (repower)

VW GRANTS REIMBURSEMENT

- This is a reimbursement program.
- Projects initiated prior to filing an application are not eligible for funding.
- Government projects:
  - Up to 65% of the cost for electric repower or EV replacement (includes EVSE)
- Non-government projects:
  - Up to 60% of the cost for electric repower or EV replacement (includes EVSE)
- Payment directly from Wilmington Trust.

CT CSB SUPPLEMENTAL GRANT - BACKGROUND

- Sec. 13 of PA No. 22-25 authorizes DEEP to establish a grant program to provide supplemental funds necessary for municipalities, school districts and school bus operators to submit federal grant applications, for the purpose of funding projects for electric school buses and EV charging infrastructure.

- DEEP has been authorized $20 million in bond funding under PA 22-118 to support implementation of this program.

- Of the $20 million, $6 million has been allotted by the Bond Commission and of that $5.4 million has been allocated to projects.

- Easiest to get this funding when projects are “shovel ready”/“planning complete” because DEEP must get authority to use the funds from Bond Committee hearings.

THREE STATE-LEVEL OPPORTUNITIES FOR CLEAN SCHOOL BUS FUNDING

- State Diesel Emissions Reduction Act (DERA) Funding
  - **Status of 2025 State DERA is uncertain at the federal level**
- Volkswagen (VW) Settlement Grants
  - **Next round anticipated late 2025/early 2026**
  - **Scrappage limited to 2009 buses or older**
- Connecticut Clean School Bus (CT CSB) Supplemental Grants
  - **Seeking expanded eligibility in 2026 legislative session, currently tied only to federal funding**
  - **Looking for Planned Projects**

CONTACT US

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DEEP Mobile Sources Group

deep.mobilesources@ct.gov

For DERA – Care of Patrice Kelly

For VW – Care of Kaitlin Stern

Details for all programs can be found at:
www.ct.gov/deep/MobileSources

DISCUSSION & QUESTIONS

Thank you for Joining Us!

We appreciate your time and participation. Please feel free to reach out with any questions or follow-ups.

Next Steps:

- Slides and recording will be shared via email.
- Stay connected with us on http://cleantransportationct.org/

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