



Get Plugged in to Electric School Buses

New Jersey School Board Association Workshop
October 26, 2022

What is Sustainable Jersey?

- **Certification program** for municipalities and schools
- **Tools, resources, and guidance** to help municipalities and schools become more sustainable
- **Grants and funding** for municipalities and schools
- **Regional Hubs**




Statistics

2014
Program
Started

64%
Districts
Participating

1,058
Schools
Registered


306
Certified


48
Certified


43 Digital
Schools
Stars

7,861
Actions
Implemented



Statistics current as of 10/5/22

Participants Map Search

Use the [Participating Districts & Schools](https://sustainablejerseyschools.com/certification/search-participating-districts-schools-approved-actions/) (*sustainablejerseyschools.com/certification/search-participating-districts-schools-approved-actions/*) page to find examples of documentation from certified schools and connect with school green teams

Search by action

By Certified Action

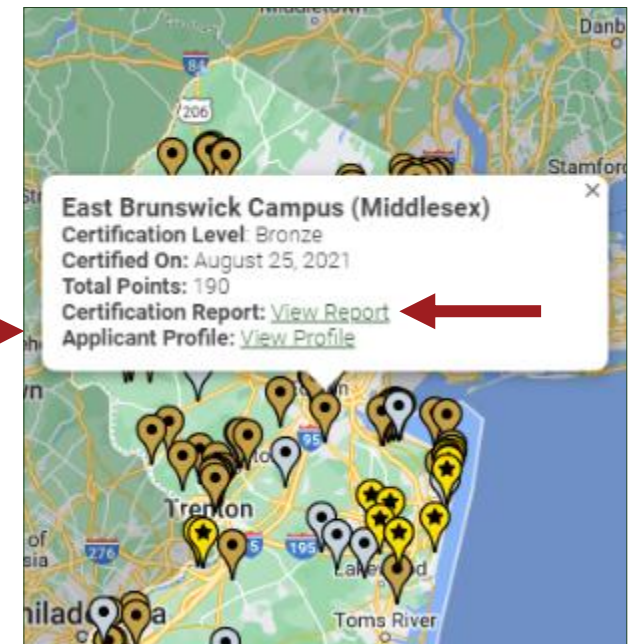
Board Leadership & Planning

- District Sustainability Policy
- Professional Development for Sustainability
- Green Enhancement of District Strategic Plans
- Strategic Plan Implementation of Green Initiatives
- School Community Asset Mapping
- School District Foundation

View certified schools approved for that action

APPLICANT	COUNTY	CERTIFICATION
Alexandria Middle School (Hunterdon)	Hunterdon	BRONZE
Lester D. Wilson Elementary School (Hunterdon)	Hunterdon	BRONZE
Florence M. Burd Elementary School (Sussex)	Sussex	BRONZE
Long Pond School (Sussex)	Sussex	BRONZE
Atlantic Highlands Elementary School (Monmouth)	Monmouth	BRONZE
Bedminster Township Elementary School (Somerset)	Somerset	BRONZE
Ray W. Brown Middle School (Bergen)	Bergen	BRONZE
Berkeley Elementary School (Essex)	Essex	BRONZE

View certification report for example documentation





SJS Energy Actions

Facilities and Operations

Energy Efficiency	Renewable Energy	Alternative Fuel Vehicles
<ul style="list-style-type: none"> • Carbon Footprint * • Energy Tracking and Management • Energy Efficiency for School Facilities * 	<ul style="list-style-type: none"> • On-Site Solar Energy + 10 pt storage/resilience + 5 pts solar thermal • On-Site Geothermal • Buy Renewable Energy 	<ul style="list-style-type: none"> • Sustainable Fleets

Student Engagement

Student Engagement and Community Outreach Actions
<ul style="list-style-type: none"> • Behavior-Based Energy Efficiency in Schools • Civic & Stewardship Volunteer Initiatives • Community Education and Outreach * • Education for Sustainability • Enrichment Programs through Partnership • Green Challenges • Professional Development for Sustainability *

* = priority action

Agenda

Chuck Feinberg

Executive Director

New Jersey Clean Cities Coalition

Peg Hanna

Assistant Director Air Monitoring and Mobile Sources

New Jersey Department of Environmental Protection

Tracey Woods

Project and Research Specialist

Sustainable Jersey

Preparing for the Transition to Electric School Buses – Best Practices and Resources

October 26, 2022

Chuck Feinberg – Executive Director, NJ Clean Cities Coalition & Managing Partner, Greener by Design



CLEAN CITIES COALITION NETWORK



Clean Cities Coalition Network

National partnership of 85+ coalitions to advance affordable, domestic transportation fuels and technologies



Clean Cities Coalitions:

- Serve as forums for local stakeholders to connect and collaborate on saving energy and using affordable alternative fuels
- Provide grassroots support and resources on new transportation technologies and infrastructure development
- Support networks to help their stakeholders identify cost-effective solutions that work locally

Clean Cities Portfolio



**Light-,
Medium-, and
Heavy-Duty
Vehicles**



**Alternative and
Renewable
Fuels and
Infrastructure**



**Idle Reduction
Measures and
Fuel Economy
Improvements**



**New Mobility
Choices and
Emerging
Transportation
Technologies**

Technology Integration Program


Provides objective/unbiased data and real-world lessons learned that inform future research needs and support local decision-making



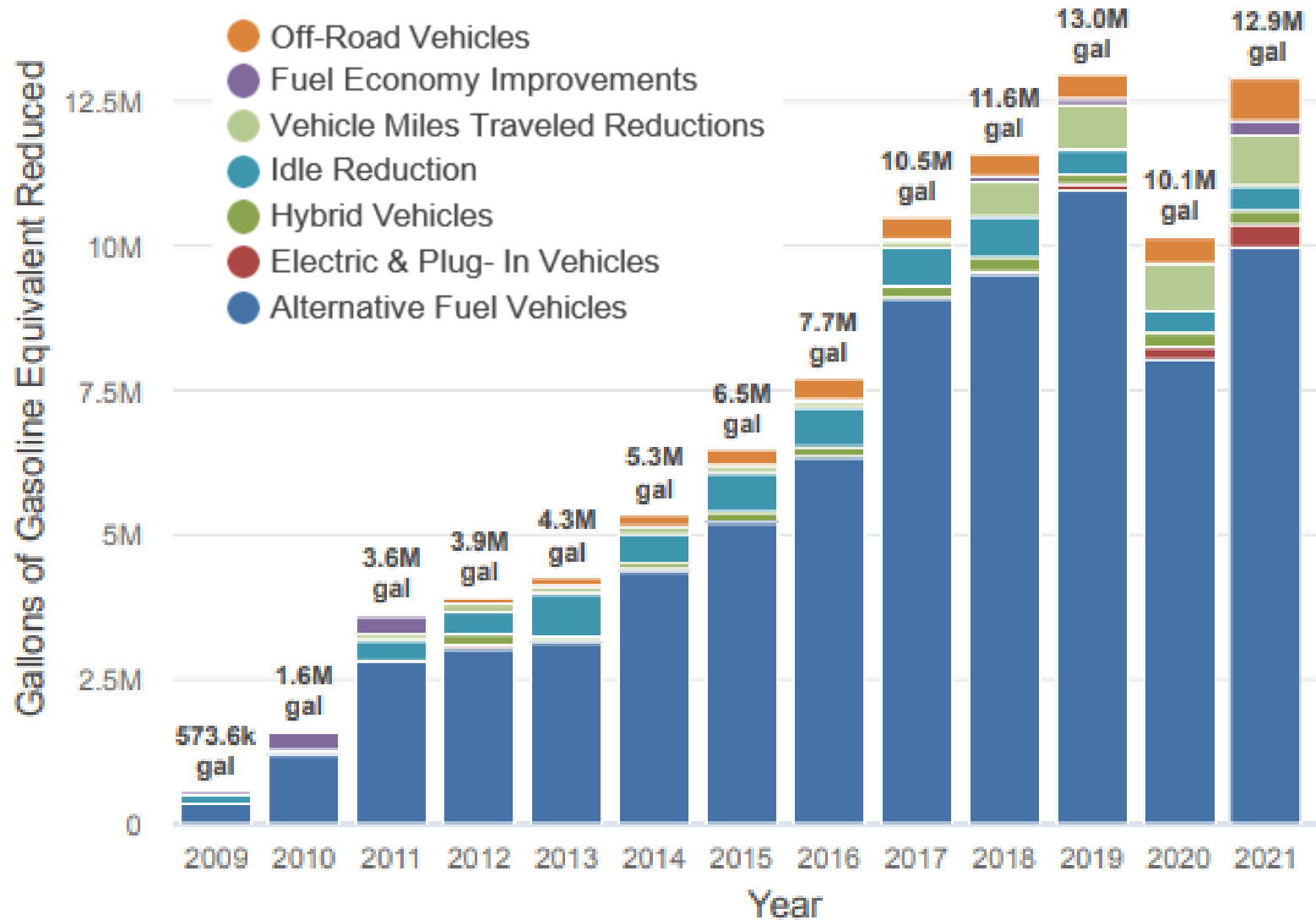
NJCCC 2022 Displacement Goal: 16 Million GGE's

Measuring Clean Cities Coalition Impact

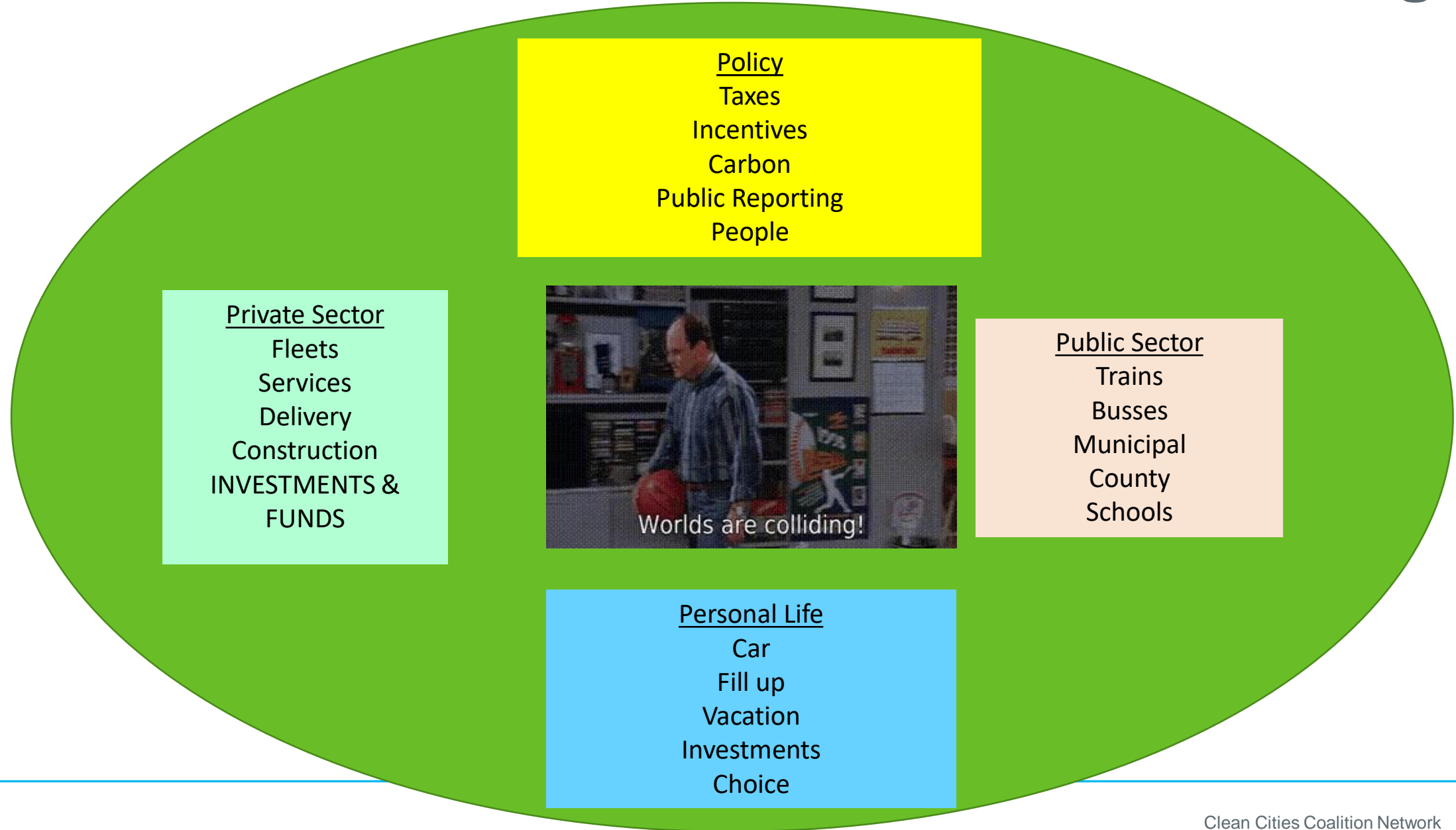
Cumulative Impact
10 Billion GGE's



Enough to drive the distance to the sun and back
1,175
times

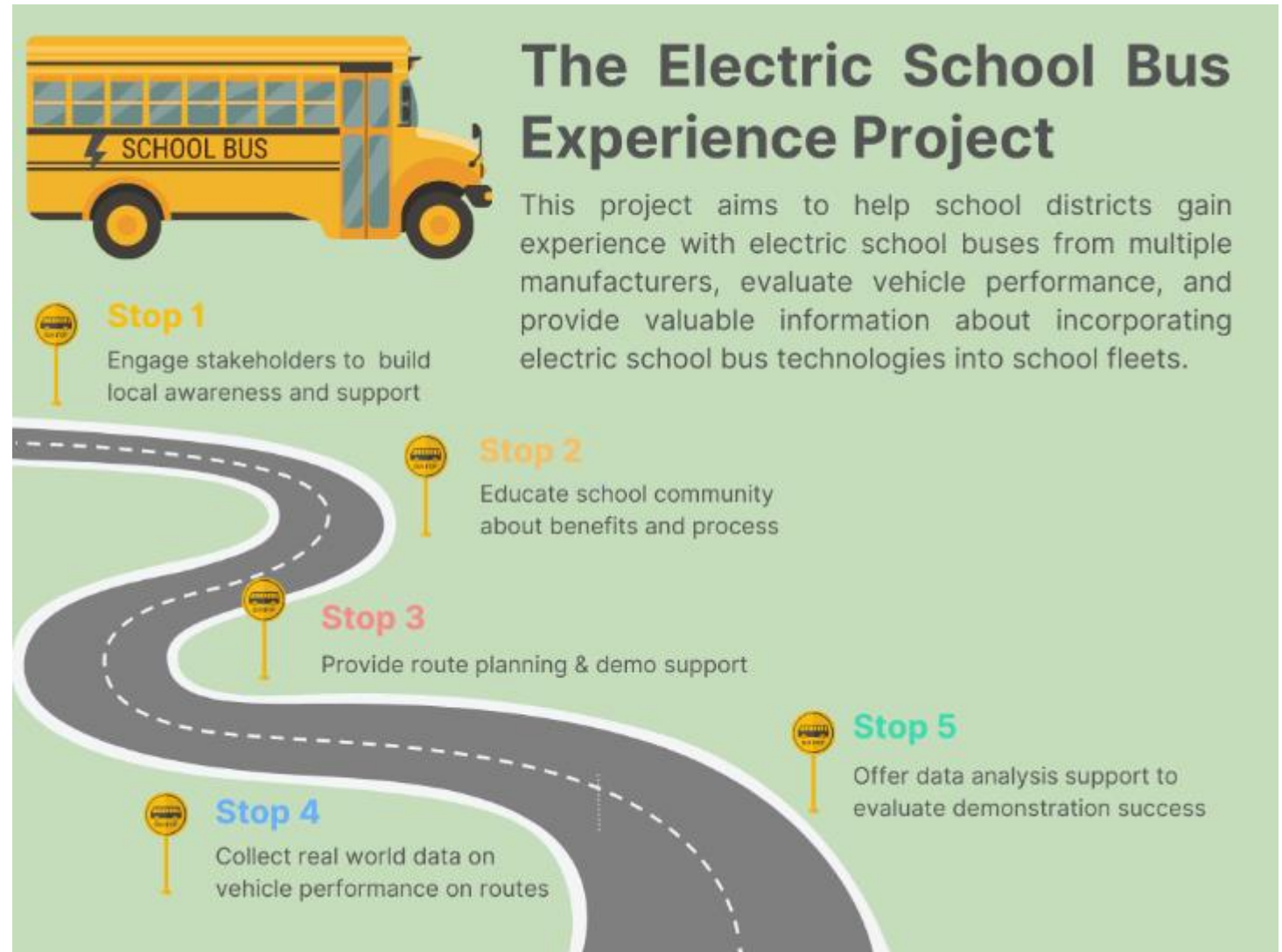


Vehicle Electrification - The Worlds are Colliding!



MEEP Program Overview

- Increase awareness & adoption of ESB and provide demos throughout NJ
- Build local support for ESB's through direct staff experience
- Education and training resources for school districts and contractors
- Collect operational data
- Analyze data and evaluate route selection and other fleet metrics for success
- **Planning Now for 2023 Demonstration Events**



Project Partners



Electric School Bus Planning & Training Resources



Steps to Electrification

1. Assess your fleet

Identify School Bus Operational Practices and Parameters (seasonal variation, routes, distances & passenger numbers).

2. Determine your intended pace of bus electrification and charging locations

Decisions you make now may affect your future expansion efforts, plan ahead.

3. Identify your project priorities

Identify your school district's top priorities (e.g., cost savings, health impacts, carbon emissions reductions, etc.) and related ESB benefits.

4. Identify key contacts at your electric utility, communicate early and often, and understand your electric utility rates

Demand charges are fees applied to the electric bills of commercial and industrial customers based upon the highest amount of power drawn during any (typically 15-minute) interval during the billing period.

Steps to Electrification

5. Understand the construction and installation requirements

Construction, equipment and operation costs are extremely site-specific and vary based on a number of factors.

6. Determine charging and power requirements

Not all vehicles and chargers are built the same. It is critical to properly plan for the specifications of the vehicle and the charger to avoid installing the wrong equipment and being unable to charge your vehicles.

7. Consider V2X and disaster response & resiliency opportunities

With predictable schedules and large battery capacities, ESBs are well suited for V2X and offer opportunities to provide additional benefits to the owner and the community through use as emergency mobile power units.

Training Modules & Tools

INFRASTRUCTURE PLANNING TOOL
A School Bus Fleet's Guide to Successful Electric Bus Charging

Going Electric
Are you a school bus fleet that is considering going electric? Start here! Children are the future, and we need modern transportation solutions to keep our youth healthy while taking them to school. To electric can be easy with the right steps, this tool will help you get started by providing guidance on the planning required to implement electric charging at your bus depot.

Infrastructure First
For electrifying a school bus fleet, infrastructure remains to be the biggest barrier to technology. Infrastructure challenges such as deployment lead time, costly upgrades, space constraints, and charges are impacting a fleet's ability to effectively own and operate an electric school bus fleet. In this guide, you will learn the basics of how to anticipate scaling needs, build out your depot, and work with your utility so that your charging infrastructure matches your fleet's needs.

ELECTRIC SCHOOL BUS FACILITY ASSESSMENT GUIDE

ELECTRIC SCHOOL BUS CHARGING 101

Important Considerations to Infrastructure Deployment

A number of unknowns will need to be evaluated to best determine your electric bus fleet deployment.

Anticipate scaling needs	Though a school bus fleet may initially demonstrate just a few electric buses, to determine fleet and operational suitability, it is critical to anticipate scaling needs. Your fleet could grow from 10 to 100 electric buses, so you think.
Infrastructure costs can vary	Depending on fleet size, bus technology, charging equipment, grid and power demand, infrastructure costs can vary with factors such as required utility upgrades, trenching and laying down conduit, and energy storage.
Work with your utility	Working with your utility from the onset of the planning process can help you understand potential build out requirements, cost and development timelines.
Evaluate electric vehicle rates and potential demand charges	Working with your utility to evaluate electric vehicle rates and potential demand charges is important to avoiding high charging costs while operating an electric bus fleet.



Power Planner for Electric School Bus Deployment

Nine Key Steps for School Bus Operators

Thank You!

Chuck Feinberg

Executive Director

New Jersey Clean Cities Coalition, A NJ Nonprofit Corp

www.njcleancities.org

Twitter: @njcleancities

LinkedIn Group: New Jersey Clean Cities Coalition

Managing Partner, Greener By Design, LLC

www.gbdtoday.com

cfeinberg@gbdtoday.com

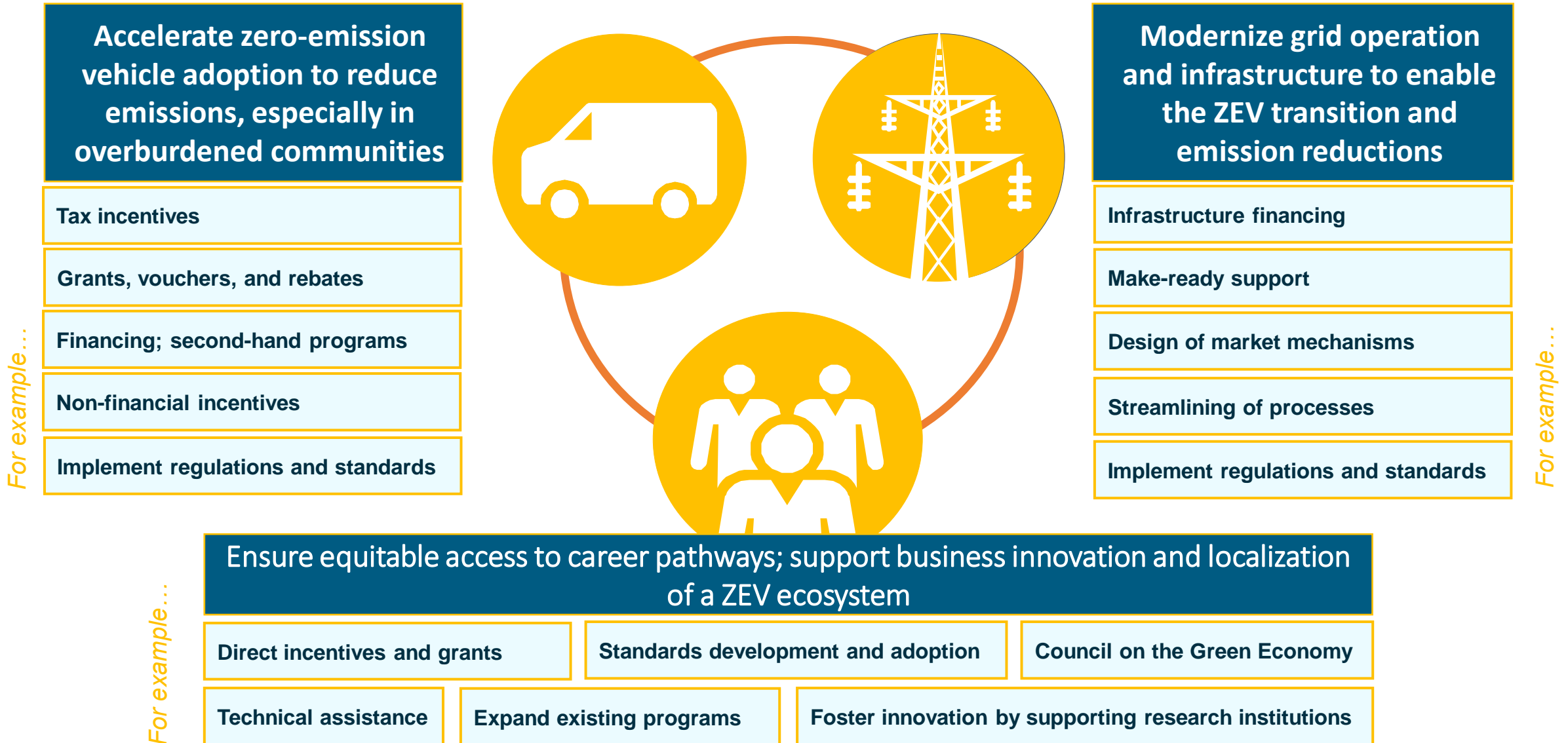




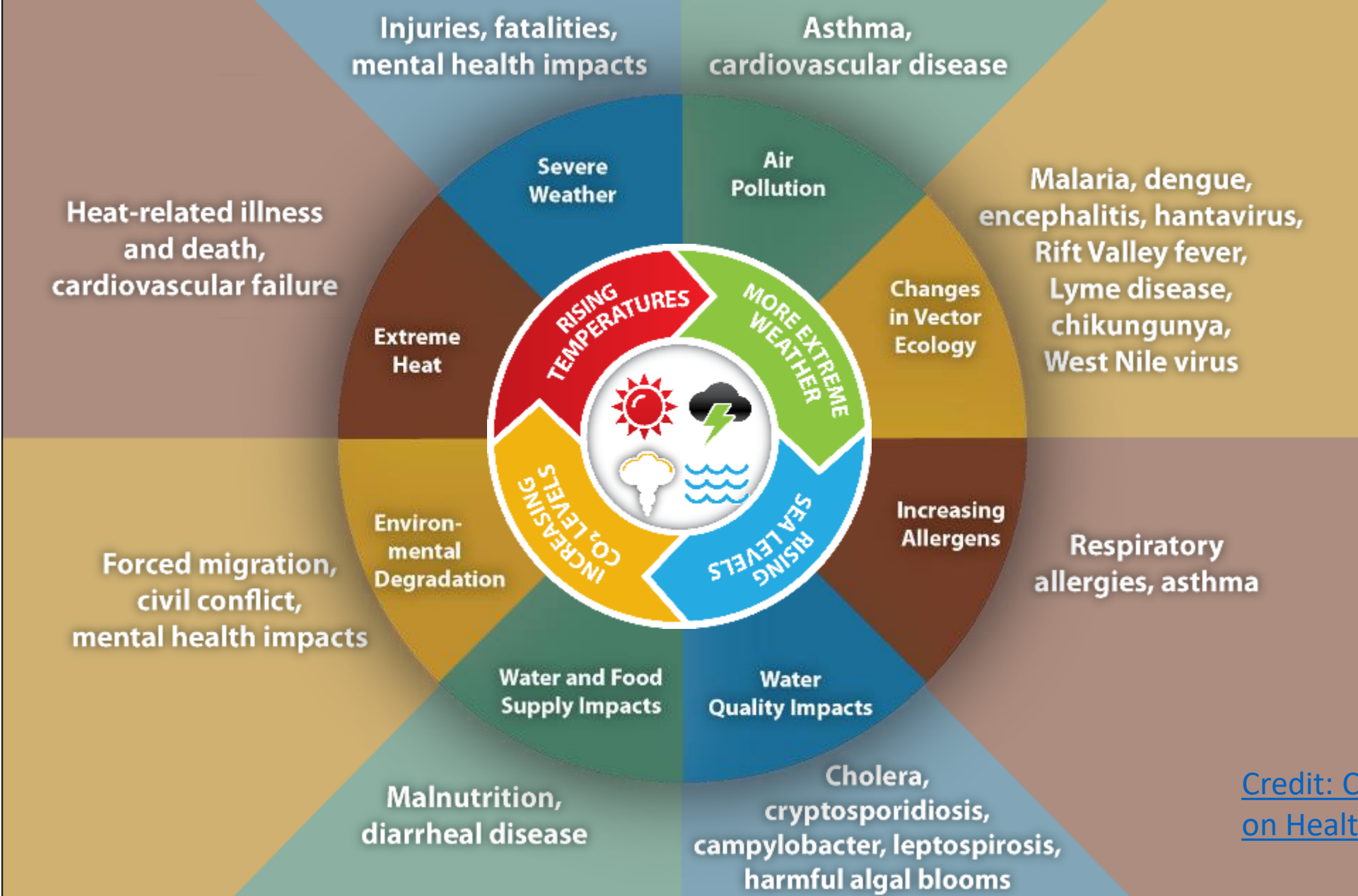
Transportation Electrification: Getting to 2050

Peg Hanna, Assistant Director
Division of Air Quality, NJDEP
October 26, 2022

Use whole of government approach and tools – financial, regulatory, and influence – to address ZEV transition at intersection of environment, energy, and economy

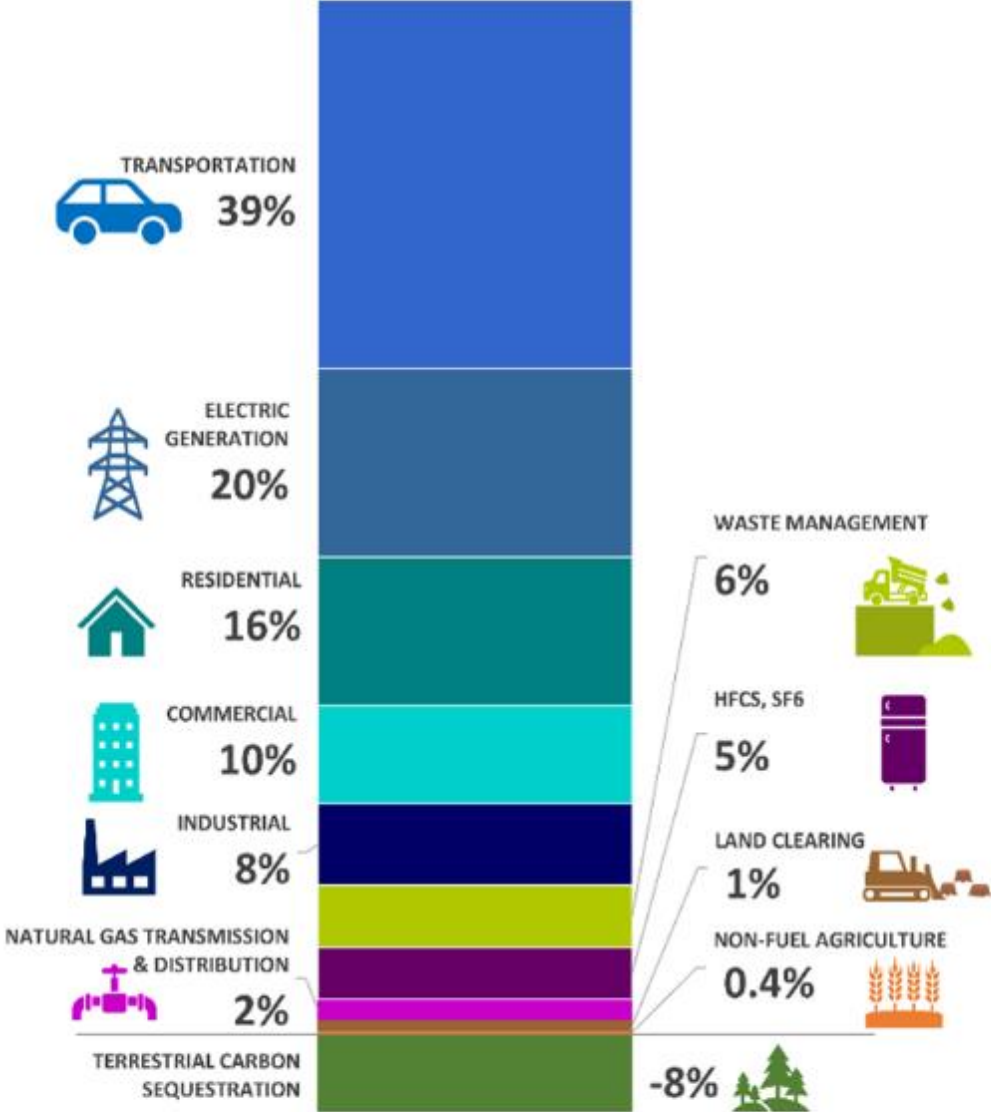


Impact of Climate Change on Human Health

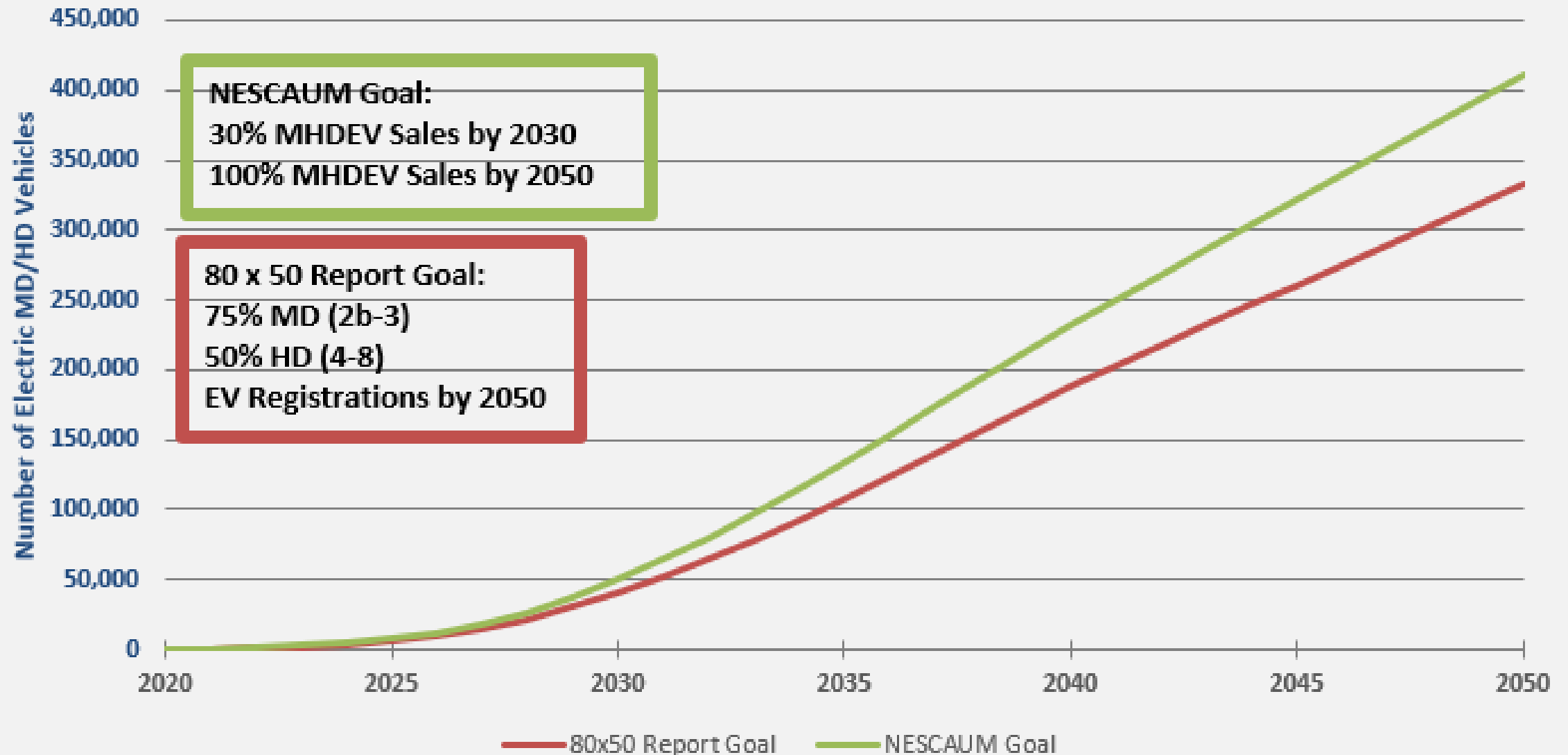


[Credit: Climate Effects on Health | CDC](#)

NJ GREENHOUSE GAS SOURCES & SINKS 2019



Medium & Heavy Duty Electrification Goals



Medium & Heavy-Duty Vehicle Electrification Grants

DEP grants to replace old diesel vehicles & equipment with electric.

Examples: school buses, transit buses, garbage trucks, delivery trucks, port trucks and equipment. Includes associated charging equipment.

Priority given to overburdened communities.

Competitive solicitation.

Stay tuned for future funding rounds.



RGGI & VW School Bus Awards

- 77 Buses awarded
- Over \$24.5 million allocated

VW Mitigation Funds (2019 - 2021)			
Recipient	Location	# of Buses	Cost
Student Transportation of America Inc.	Trenton	5	\$1,975,000
Durham School Services	Elizabeth	5	\$1,921,510
Jersey City Public Schools	Jersey City	5	\$1,839,500
Total		15	\$5,736,010

RGGI Auction Proceeds (2021 - 2022)			
Recipient	Location	# of Buses	Cost
Belair Transport	Orange	7	\$2,517,500
Belleville Board of Education	Belleville	2	\$834,604
D&M Tours Inc.	Paterson	4	\$1,628,136
Kearny Board of Education	Kearny	2	\$715,564
Elizabeth Board of Education	Elizabeth	2	\$800,000
Aldin Transportation Corporation	Passaic County/Paterson	6	\$1,877,872
George Dapper Inc	Mercer County	2	\$524,615
Jay's Bus Service	Ocean County	8	\$2,018,458
Yeshivah Masoras Avos	Ocean County	1	\$252,307
United Talmudical Academy of Lakewood	Ocean County	1	\$252,307
Leonia Board of Education	Bergen County	7	\$1,776,151
First Student	East Orange	6	\$1,696,062
Dover Board of Education	Morris County	1	\$252,307
Bogota Board of Education	Bergen County	1	\$252,307
Haledon Board of Education	Haledon	1	\$400,000
Garfield Board of Education	Bergen County	2	\$504,616
Holcomb Transportation LLC	Camden County	6	\$1,615,844
Keyport Auto Body Inc. (Shamrock Stagecoach)	Middlesex County	3	\$882,316
Total		62	\$18,800,966

NJ ZIP



NJ ZIP Phase 2

WHAT: A first-come, first-serve ZE MHDV voucher pilot

WHEN: Vendor application launching Oct 18

Purchaser voucher application launching early 2023

WHO: NJ businesses or institutions that operate >75% VMT of new ZE MHDV anywhere in NJ for 3 years

Phase 2 base voucher values

Class 2b	\$20,000
Class 3	\$50,000
Class 4	\$65,000
Class 5	\$80,000
Class 6	\$90,000
Class 7	\$135,000
Class 8	\$175,000

Phase 2 potential bonuses

- Small business bonus: 25%
- MWBE, VOB bonus: 4% per certification
- EJ community bonus: 10%
- NJ Manufacturer bonus: 25%
- School bus bonus: 25%

Vouchers are capped at 100% of vehicle cost, and \$3M per EIN

To date, NJ ZIP Phase 1 has approved over \$43M in vouchers for nearly 200 small businesses and 400 medium-duty vehicles in overburdened communities!

NJ School
bus pilot
program –
P.L. 2022,
c.86

3 year competitive grant program
@\$15 million/yr

At least 6 awards per year
geographically distributed.

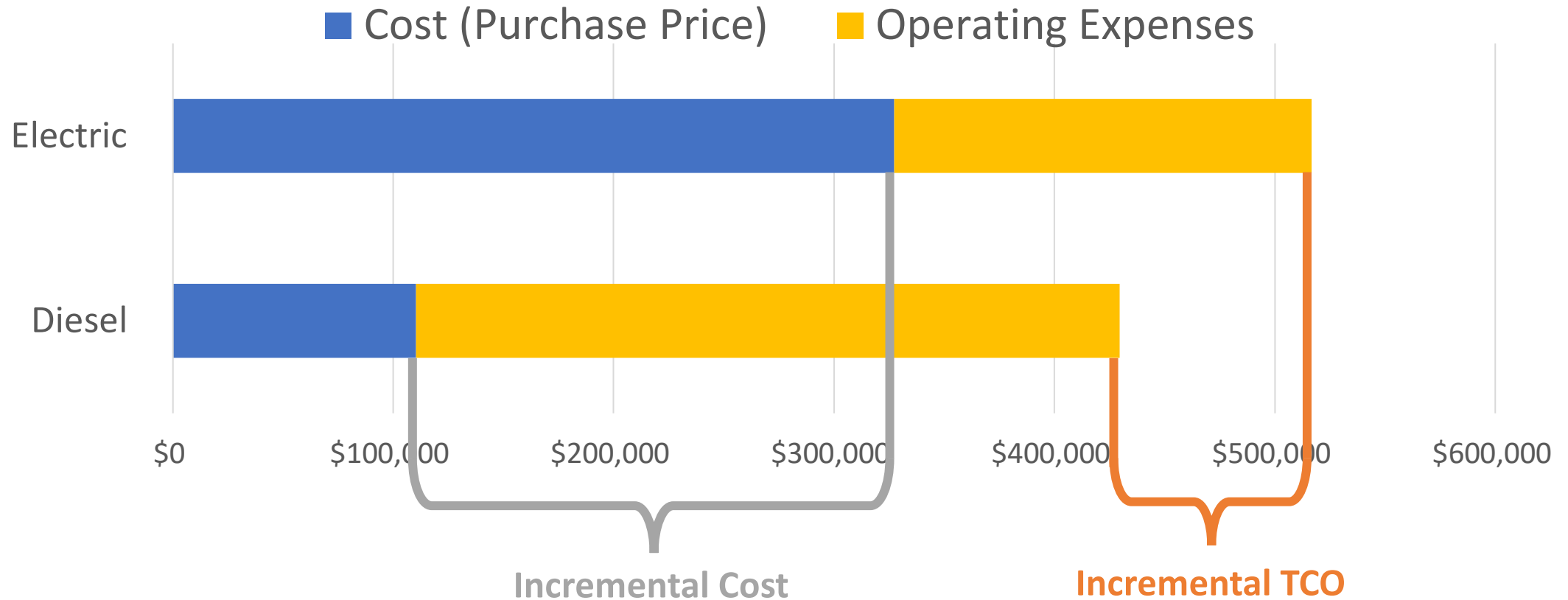
Grantees submit periodic reports on
cost, maintenance, reliability,
operational issues.

Incremental Cost and TCO

Upfront Cost = Purchase price of vehicle and charging infrastructure costs

TCO = Total Cost of Ownership over the life of the vehicle

Cost and TCO



Stakeholder Questions

Are Type D (transit-style) buses appealing?

What do you know about e-school bus insurance costs?

What financial assistance would you need to justify buying e-school buses and associated charging?

How can we best complement school budgets?

EPA Clean School Bus Program

- The Infrastructure Investment and Jobs Act, aka the Bipartisan Infrastructure Law, was signed **November 15, 2021**.
- \$1b/year nationally. Cap of 10% per state. EV and alt fuels eligible.
- National competition run by EPA.



Summary

Lottery system.

Up to 25 buses per district – must purchase not lease.

Priority districts get first dibs and greatest funding.

Charging station is eligible cost plus can stack with utility funding.

Must scrap 2010 or older diesel bus.

New Jersey Priority School Districts

- **New Jersey = 51** Priority School Districts identified by EPA
 - **High Need = 39** School Districts (20% or greater student poverty)
 - **Rural = 12** School Districts
- <https://www.epa.gov/system/files/documents/2022-05/2022-csb-rebates-prioritized-school-districts-2022-05.pdf>

District Name	City
Alexandria Township School District	Pittstown
Alloway Twp School District	ALLOWAY
Asbury Park School District	Asbury Park
Atlantic City School District	Atlantic City
Blairstown Elementary Township School District	Blairstown
Bridgeton City School District	Bridgeton
Camden City School District	Camden
Delaware Valley Regional High School District	FRENCHTOWN
Downe Township School District	Newport
East Newark School District	East Newark
East Orange School District	East Orange
Egg Harbor City School District	Egg Harbor City
Elizabeth Public Schools	Elizabeth
Fairview Public School District	Fairview
Frankford Township Consolidated School District	Branchville
Gloucester City Public School District	Gloucester City
Greenwich Township School District	GREENWICH
Guttenberg School District	Guttenberg
Haledon Public School District	Haledon
Irvington Public School District	IRVINGTON
Jersey City Public Schools	Jersey City
Keansburg School District	Keansburg
Lakewood Township School District	Lakewood
Lindenwold Public School District	Lindenwold
New Brunswick School District	New Brunswick
Newark Public School District	Newark
North Warren Regional School District	Blairstown
North Wildwood School District	North Wildwood
Ocean Gate School District	Ocean Gate
ORANGE BOARD OF EDUCATION School District	ORANGE
Passaic City School District	Passaic
Paterson Public School District	Paterson
Paulsboro School District	PAULSBORO
Penns Grove-Carneys Point Regional School District	Penns Grove
Phillipsburg School District	Phillipsburg
Pleasantville Public School District	Pleasantville
Pompton Lakes School District	POMPTON LAKES
Prospect Park Public School District	Prospect Park
Ridge and Valley Charter School	Frelinghuysen
Salem City School District	SALEM
Sandyston-Walpack Consolidated School District	Layton
Seaside Heights School District	SEASIDE HEIGHTS
The Lower Alloways Creek School District	Salem
Trenton Public Schools	Trenton
Union City School District	Union City
West Cape May School District	WEST CAPE MAY
West New York School District	West New York
Wildwood City School District	WILDWOOD
Woodbine School District	Woodbine
Woodland Township School District	Chatsworth
Woodlynne School District	Woodlynne

School Bus & Infrastructure Funding Amounts

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

Visit our website and follow us



One stop shop for EV info!

www.drivegreen.nj.gov

Join our listserv for updates and funding announcements

www.state.nj.us/dep/stophesoot/sts-listserv.htm



Instagram [drivecleannj](https://www.instagram.com/drivecleannj)



Facebook [NJDEPAQES](https://www.facebook.com/NJDEPAQES)



Twitter

[@NewJerseyDEP](https://twitter.com/NewJerseyDEP)



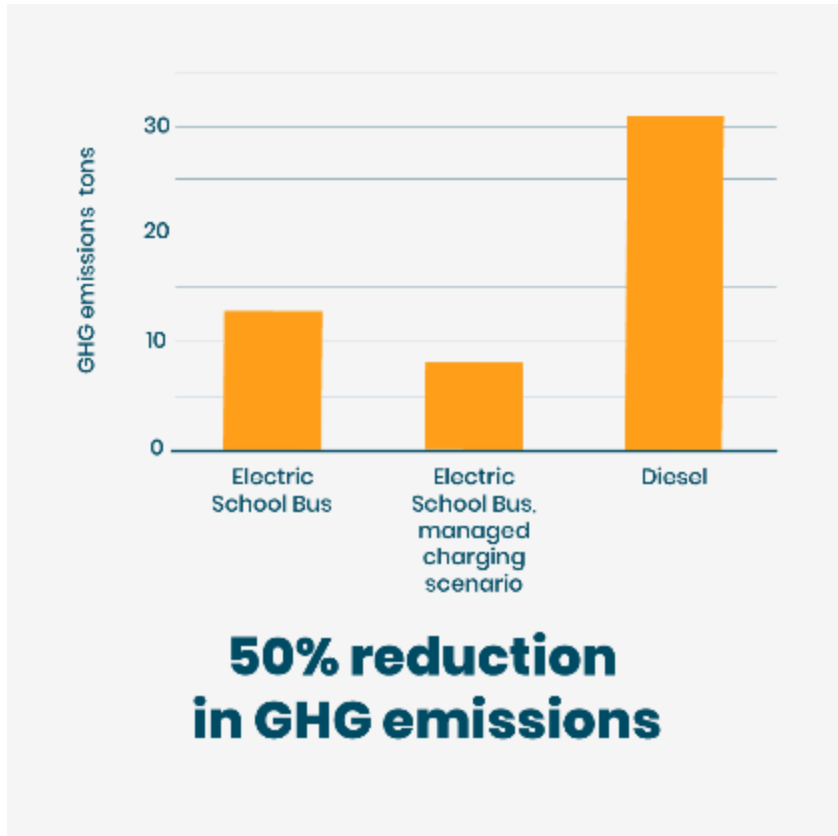
Thank you!

Peg Hanna, Assistant Director
Division of Air Quality, NJDEP

Peg.hanna@dep.nj.gov



Why Electric School Buses?



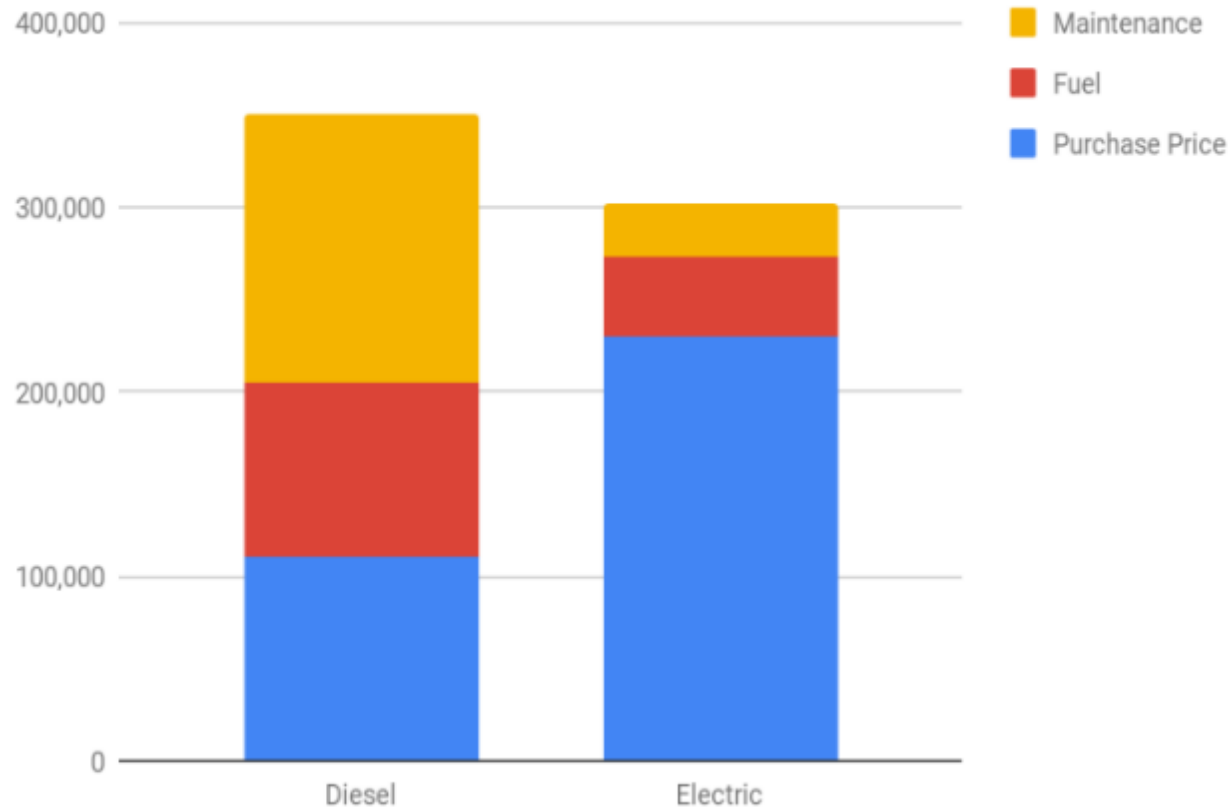
- Up to 50% reduction of Greenhouse Gas Emissions
- Improved air quality for students
- Quieter
- Less expensive O&M

VEIC. 2018. *MA pilot program shows electric school buses can cut GHG emissions in half.*

www.veic.org/clients-results/case-studies/ma-pilot-program-shows-electric-school-buses-can-cut-ghg-emissions-in-half



Total Lifecycle Costs of School Buses



When comparing the cost of an EV with a traditional vehicle consider **Total Cost of Ownership.**

USPIRG. 2018. *Paying for Electric Buses.*

<https://uspig.org/sites/pirg/files/reports/National%20-%20Paying%20for%20Electric%20Buses.pdf>



Preparing for Fleet Electrification

Parking and Charging

- Where will vehicle be parked?
- Will charging infrastructure be available?

Building Support for EVs with Fleet Users

- Arrange a test drive/demo
- Outreach to fleet users
- Current vehicle usage that can inform vehicle purchases



Photo credit: California Energy Commission

Sustainable Jersey Webinar

[Join the EVOlution!](#) - EV Charging information



Sustainable Fleets for Schools

5 points

- Acquire plug-in hybrid vehicle

10 points

- Acquire one of following:
 - Electric vehicle
 - Compressed natural gas (CNG) heavy-duty vehicle
 - Propane school bus

15 Points

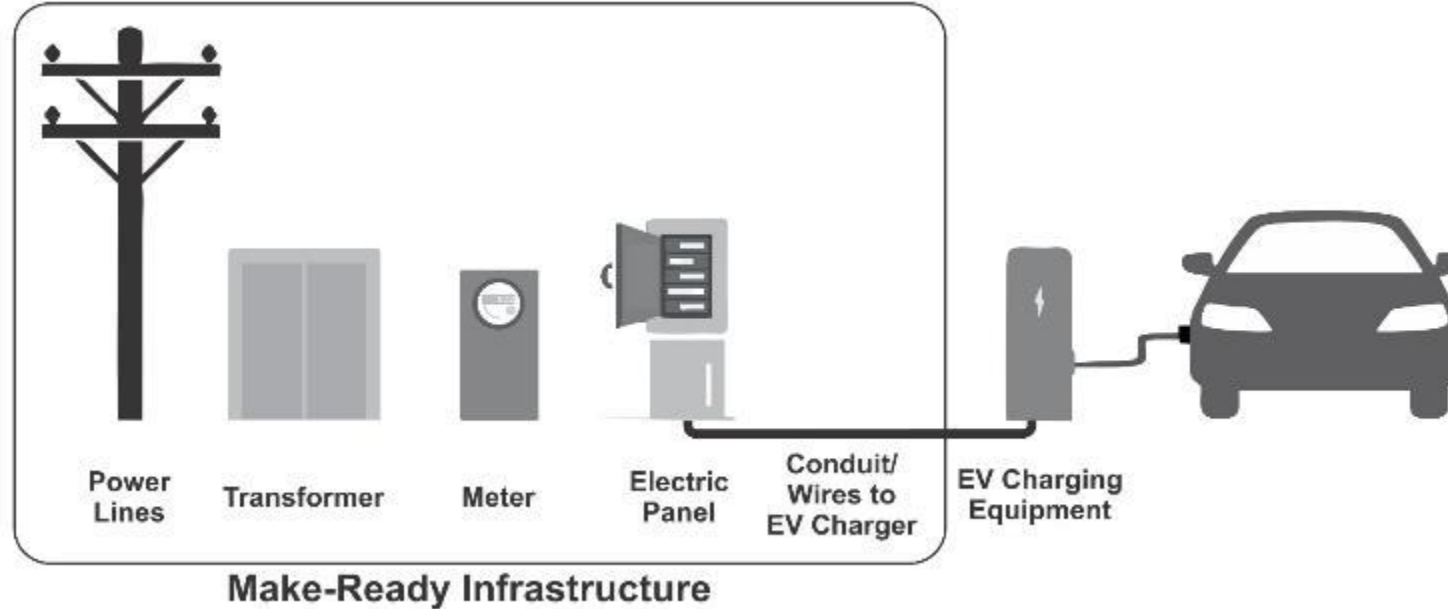
- 5% total district fleet (2 vehicles minimum) comprised of:
 - Plug-in hybrid vehicles
 - Electric vehicles
 - Compressed natural gas (CNG) heavy-duty vehicles
 - Propane school buses

How can vehicles be acquired?

Vehicles **purchased, leased**, provided via a **service contract** or **shared service** are eligible for point in this action.



Utility EV Charging Incentives



Atlantic City Electric (ACE) Electric Vehicle Program

www.atlanticcityelectric.com/SmartEnergy/InnovationAndTechnology/Pages/Electric-Vehicle-Program.aspx

Jersey Central Power and Light Electric Vehicle Webpage https://www.firstenergycorp.com/help/saving_energy/electric-vehicles/nj-ev.html

PSE&G Electric Vehicle Charging Program

nj.myaccount.pseg.com/myservicepublic/electricvehicles

Rockland Electric Company Electric Vehicle Webpage

www.oru.com/en/our-energy-future/technology-innovation/electric-vehicles/nj-commercial-ev?language=en



Procurement Guidance

Sustainable Jersey Alternative Fuel Vehicle Procurement Guide

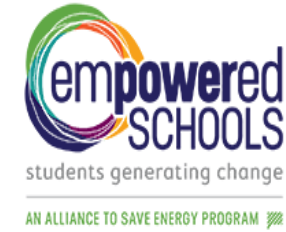
Includes guidance for capturing tax credits and procurement options

- Fleet Leasing
- Purchasing Cooperatives / Government Contracts
- Direct Purchase Options
- Service Contracts/Shared Service

https://www.sustainablejersey.com/fileadmin/media/Actions_and_Certification/Actions/Energy/Sustainable Jersey Alternative Fuel Vehicle Procurement Guide.pdf



EmPowered Schools



The EmPowered Schools program provides free support and resources to engage PK-12 students in hands-on learning to take the lead in saving energy and money in their schools and homes.

**LEARN MORE AND SIGN UP
VIA THE QR CODE OR BY GOING TO:**

bit.ly/SJSEmpoweredSchools





Sustainable Jersey Energy Technical Assistance

**Sustainable Jersey Staff can
help your municipality or
school district with:**

- Energy Tracking and Management
- Applying for Local Government Energy Audits (LGEAs)
- Applying for State and utility energy efficiency incentives
- Applying for NJCEP's Energy Savings Improvement Program

Email info@sustainablejersey.com
to learn about current technical
assistance options open to your
school or municipality.



SUSTAINABLE JERSEY GRANTS PROGRAM



PSEG
Foundation

New Funding Cycle Announced!

- \$100,000 is available to New Jersey public schools participating in the Sustainable Jersey for Schools programs
 - \$2k and \$10k grants to fund sustainability projects and support your green team

Informational Webinar

3-4pm on
Thursday,
**December 15,
2022**

Application Deadline

By 11:59pm
on Friday,
**March 10,
2023**

Award Notifications

By **early May 2023** with an event in **early June 2023**

Performance Period

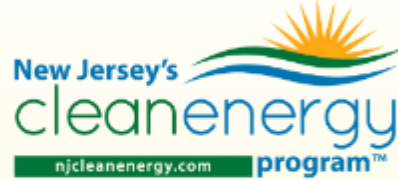
10k Grants:
18 months
2k Grants:
12 months

Learn More & Apply



Sustainable Jersey for Schools Underwriters and Sponsors

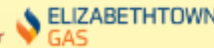
Program Underwriters



Grant Program Underwriters



Corporate Sponsors



*Digital Schools Underwriters and Sponsors



Thank You

Chuck Feinberg

New Jersey Clean Cities Coalition
chuck.feinberg@gmail.com

Peg Hanna

New Jersey Department of Environmental Protection
Peg.Hanna@dep.nj.gov

Tracey Woods

Sustainable Jersey
woodst@tcnj.edu



FOR SCHOOLS

**SUSTAINABLE
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