

Pennsylvania Medium- & Heavy-Duty Electrification Bootcamp

June 20, 2023



Electrification
Coalition

HOUSEKEEPING

- ❑ **Please Sign In:** Sign in sheet may be found at the entrance to the auditorium.
- ❑ **Agenda & Speaker Bios** are available on our event page and via the QR code found on our table outside.
- ❑ Please check out our **vehicle display** on Commonwealth Ave (alongside the Fountain Plaza at the Capitol)
- ❑ **Wi-Fi:** HU-Guest
Username: EC@HU
Password: EC@HU2023



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Introduction to the Electrification Coalition

MHD Intro

What is Medium- & Heavy-Duty Electrification? What is currently being done?

Resources

Electrification Coalition's Resources

Thank You

Big thanks to our speakers and attendees & let's get started!

About the Electrification Coalition

The **Electrification Coalition** is a nonpartisan, nonprofit organization that develops and implements a broad set of strategies to facilitate the widespread adoption of electric vehicles to overcome the economic, public health, and national security challenges that stem from America's dependence on oil.



SAFE

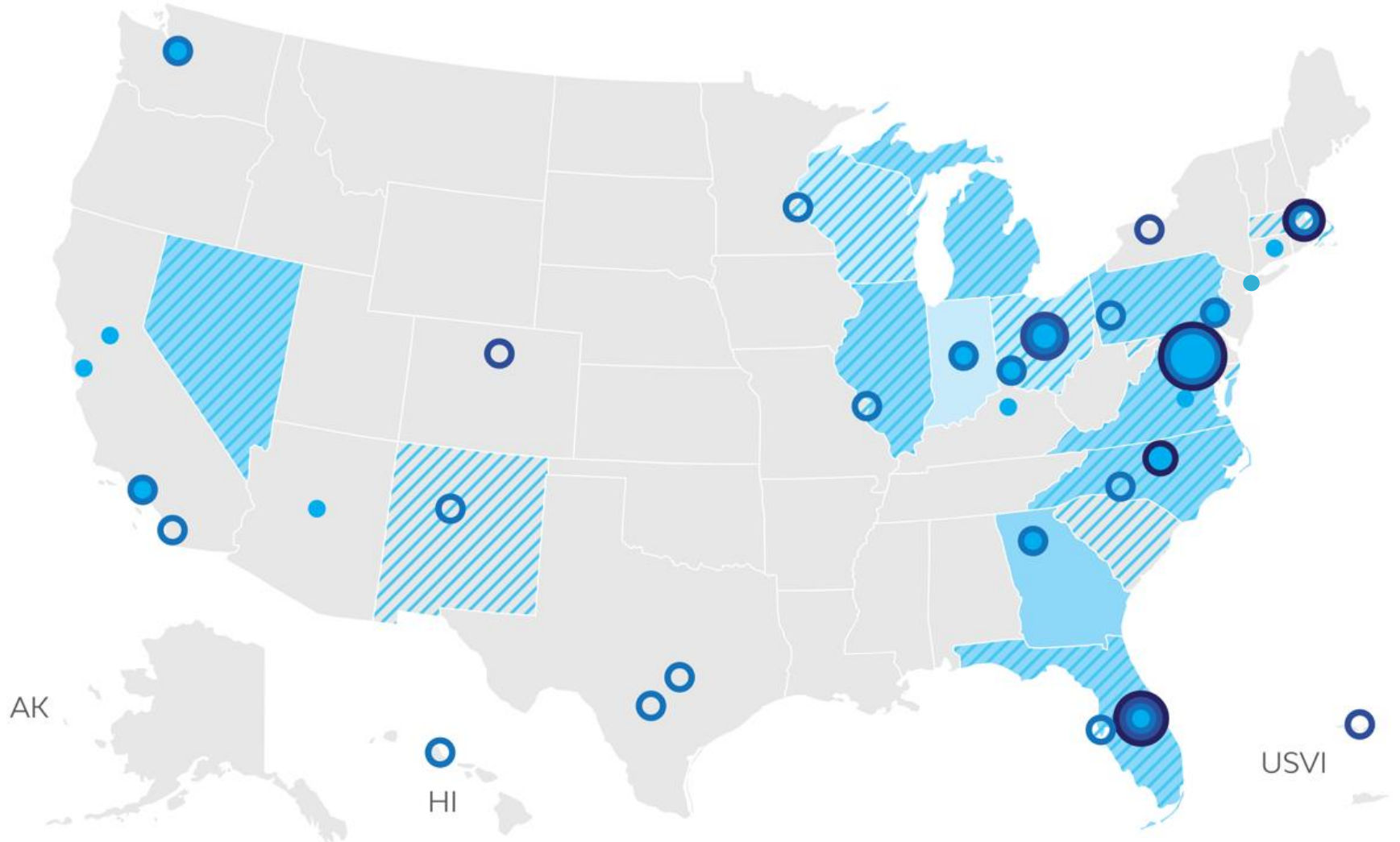


Electrification
Coalition

The EC National Presence

- EC Staff Locations
- Priority States
- Tier 2 States
- ▨ State Fleet Cohorts
- Priority Cities
- Smart / Accelerator Cities
- Roadmap Cities

*Does not include national programs like the Climate Mayors EV Purchasing Collaborative that works with more than 400 public fleets across America.



Electrification Coalition



Fleet Technical Lead



Local/State/Federal EV Policy



City Electrification Advisor



Freight Electrification



Project Leadership and Coordination



Advocacy and Education

Electrification Coalition Business Council

The United States' transition to an electrified transportation future isn't a question of if – it's when. ECBC creates a strategic alliance that can supercharge support for the policies and actions needed to accelerate transportation electrification at a mass scale.





MHD Electrification

The image shows a high-angle, night-time view of a multi-lane city street. The street is filled with traffic, including cars, a motorcycle, and a large truck. The scene is illuminated by streetlights, creating a mix of bright highlights and deep shadows. A semi-transparent blue rectangular overlay is positioned in the center of the image, containing the text 'MHD Electrification' in a white, sans-serif font. In the background, there are signs for 'The Olive Place' and 'SINO MOTOR', along with directional signs for 'North' and 'Alabang'. The overall atmosphere is that of a bustling urban environment at night.

Medium- & Heavy-Duty Equipment



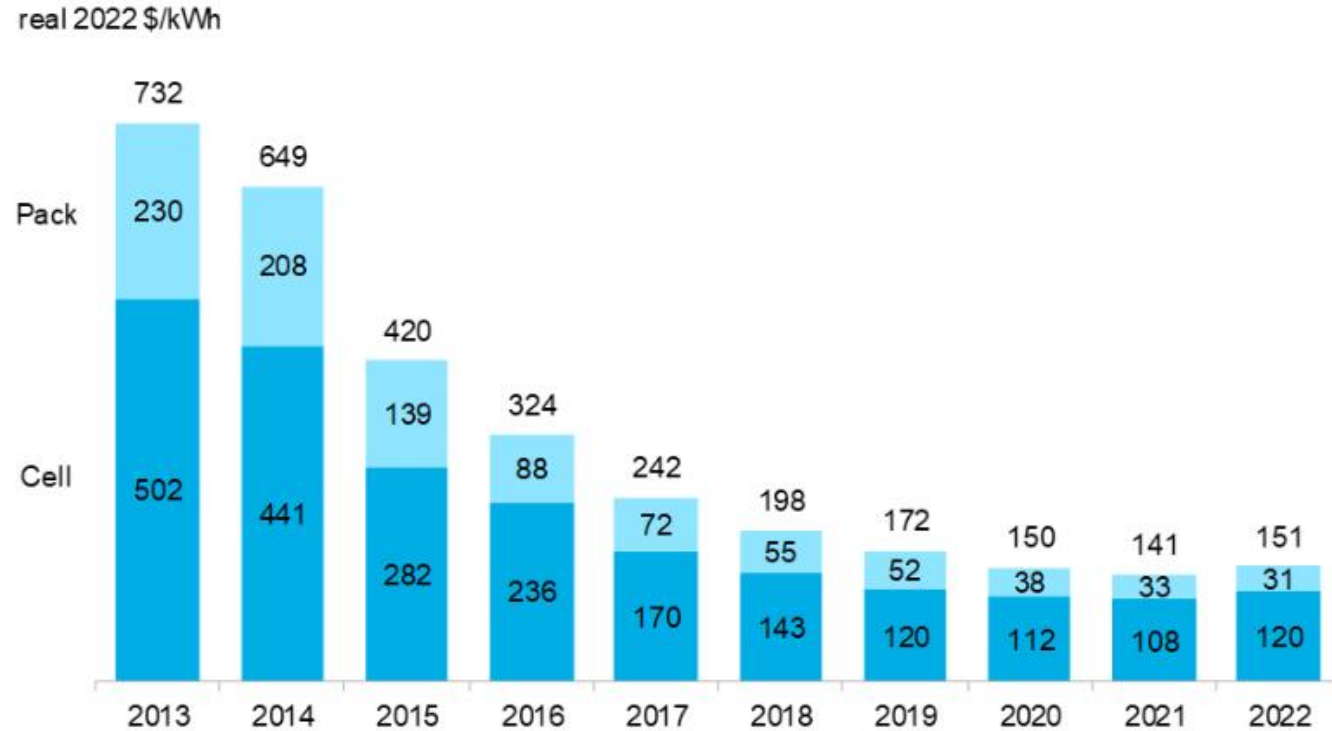
Medium- & Heavy-Duty Vehicle Costs

- The medium- and heavy-duty segment has traditionally been slower to electrify given the larger batteries needed to power the vehicle, thus increasing vehicle cost.
- Battery prices have rapidly decreased, making MHD vehicles produce lower total cost of ownership (TCO) than diesel vehicles over their lifetime.



Vehicle Cost Overtime

Figure 1: Volume-weighted average lithium-ion battery pack and cell price split, 2013-2022



Source: BloombergNEF. All values in real 2022 dollars. Weighted average survey value includes 178 data points from passenger cars, buses, commercial vehicles and stationary storage.

State and Federal Action

- Multi-State Medium- and Heavy-Duty Zero Emission Vehicle MOU signed by 17 states & D.C. – [Pennsylvania is one of them](#)
 - Aims to achieve 100% MHD ZEV sales by 2050 and 30% by 2030 in their jurisdictions
- U.S. commitment to join the [Global Commercial Drive to Zero](#)
 - Aims to achieve commercial ZEV market viability in urban areas by 2025, full market penetration ZEVs by 2040
- **Under Consideration:** [EPA Phase 3 GHG Emissions Standards](#)
 - The EPA projects this scenario will achieve ZEV adoption forecasted to gradually increase year-over-year until Model Year 2032(+), achieving:
 - 50% vocational vehicles, 35% short-haul tractors, 25% long-haul tractors



EPA Phase 3 GHG Emissions Standards for Heavy-Duty Vehicles Proposal

TABLE ES-4—AGGREGATED PROJECTED ZEV ADOPTION RATES IN TECHNOLOGY PACKAGES FOR THE PROPOSED STANDARDS, AGGREGATED PROJECTED ZEV ADOPTION RATES IN TECHNOLOGY PACKAGES FOR THE ALTERNATIVE STANDARDS, AND CALIFORNIA ACT ZEV SALES REQUIREMENTS

	MY 2027 (%)	MY 2028 (%)	MY 2029 (%)	MY 2030 (%)	MY 2031 (%)	MY 2032 and later (%)
Proposed:						
Vocational	20	25	30	35	40	50
Short-Haul Tractors	10	12	15	20	30	35
Long-Haul Tractors	0	0	0	10	20	25
Alternative:						
Vocational	14	20	25	30	35	40
Short Haul Tractors	5	8	10	15	20	25
Long Haul Tractors	0	0	0	10	15	20
CARB ACT:						
Vocational	20	30	40	50	55	60
Tractors	15	20	25	30	35	40

- Vocational vehicles are divided into 23 different subcategories for setting standards – 8 are for specialized vehicles
- For tractors, standards are divided into 10 different subcategories for standards
- In total, there are 33 unique HD vehicle subcategories for standards for each model year of the program

Utilities and Regulators thus far...

- Utility investment and regulator approval in **make-ready programs**, some select **ownership projects**, **pilot projects**, **TCO rates**
- Utility Reports & tools to get ready:
 - National Grid Electric Highways Report
 - ONCOR's Fleet Load Growth Calculator and Mapping Tool
 - Entergy E-Mobility Fleet Tool
- Utility **fleet advisory services** to get ready:
 - DTE Energy; Southern California Edison (SCE); Portland General Electric Company (PGE); Xcel; Exelon

Figure 4: Electric Utility Filings by Status Between 2012 and June 2021

Approved	Pending/Filed	Denied/Withdrawn
32 States	22 States	21 States
111 Filings	56 Filings	38 Filings
51 Utilities	33 Utilities	26 Utilities
\$3,076,300,118 Investment	\$2,093,601,953 Investment	\$537,866,476 Investment
6,257 DC Fast Charging Stations	2,558 DC Fast Charging Stations	504 DC Fast Charging Stations
223,858 Level 2 Charging Stations	212,148 Level 2 Charging Stations	86,143 Level 2 Charging Stations

Figure 2: U.S. Investor-Owned Electric Utility Transportation Electrification Approved, Denied, and Proposed Filings by Status Between July 2021 and June 2022

Approved	Pending/Filed	Denied/Withdrawn
12 States	7 States	6 States
21 Filings	10 Filings	9 Filings
17 Utilities	10 Utilities	8 Utilities
\$470,275,529 Investment	\$918,831,600 Investment	\$181,086,650 Investment
1,582 DC Fast Charging Stations	2,054 DC Fast Charging Stations	350 DC Fast Charging Stations
80,570 Level 2 Charging Stations	74,513 Level 2 Charging Stations	4,400 Level 2 Charging Stations



Resources



DRVE Tool: Dashboard for Rapid Vehicle Electrification

- Standard fleet analysis can be costly, take months, and be difficult to interpret
- Through the DRVE Tool, the EC has created a **free**, accessible, easy-to-use analysis tool that provides **total cost of ownership** and other data in minutes
- Can integrate a number of different variables including: fuel costs, purchase prices, federal and state incentives, infrastructure costs, insurance costs, etc.

Learn About Current EV Models



Alternative Fuel and Advanced Vehicle Search

Find and compare alternative fuel vehicles, engines, and hybrid/conversion systems. Some of the light-duty vehicles may count toward vehicle-acquisition requirements for [federal fleets](#) or [state and alternative fuel provider fleets](#) regulated by the Energy Policy Act. For downloads of past model years, see the [publications search](#).

Light-Duty Vehicles

All Vehicles

Vehicles by Type



[Sedan/Wagon](#)



[Pickup](#)



[SUV](#)



[Van](#)



[Step Van](#)



[Vocational/Cab Chassis](#)



[Street Sweeper](#)



[Refuse](#)



[Tractor](#)



[Passenger Van/Shuttle Bus](#)



[Transit Bus](#)



[School Bus](#)

Vehicles by Manufacturer

Light-Duty

All

SEARCH

Medium- and Heavy-Duty

All

SEARCH

Engines and Hybrid/Conversion Systems

For medium- and heavy-duty vehicles:

ENGINE & POWER
SOURCES

CONVERSION & HYBRID
SYSTEMS

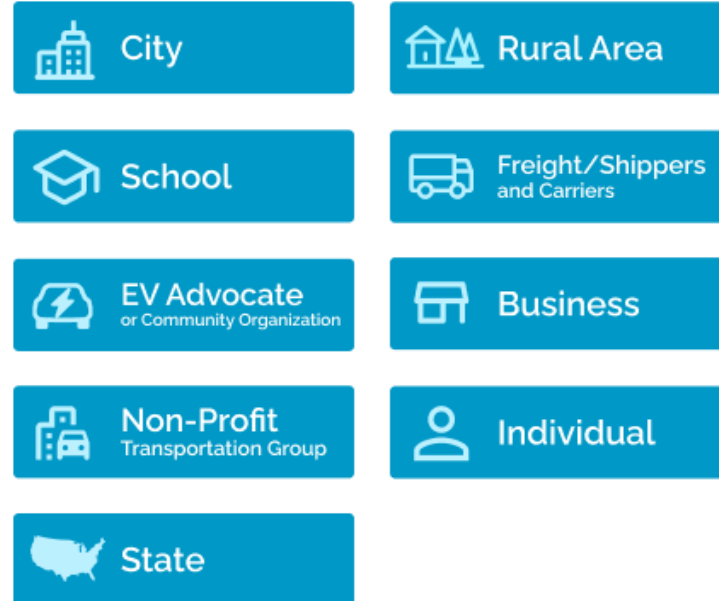
EC EV Funding Finder Tool

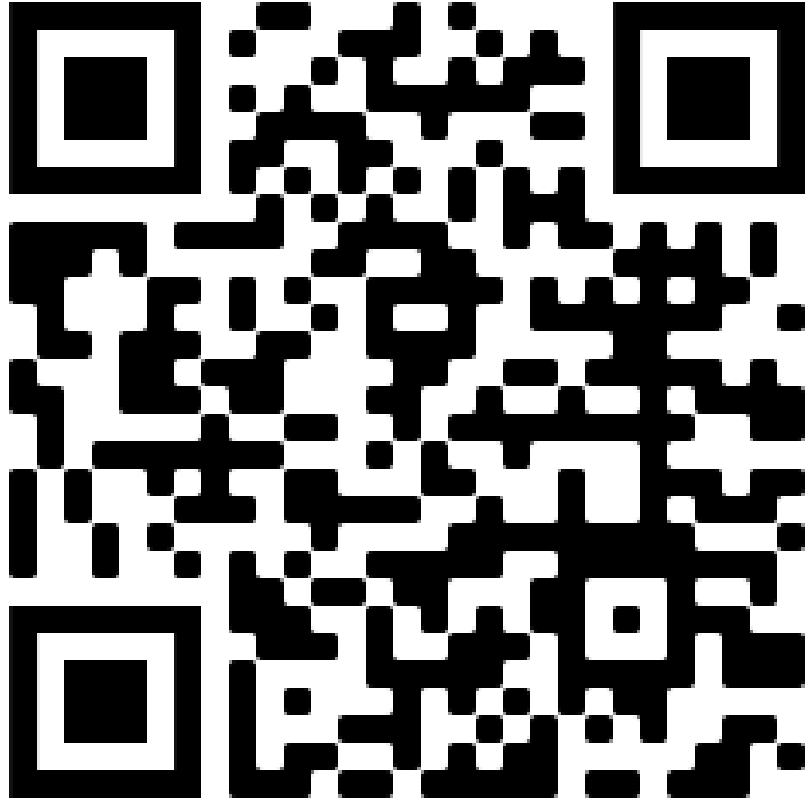
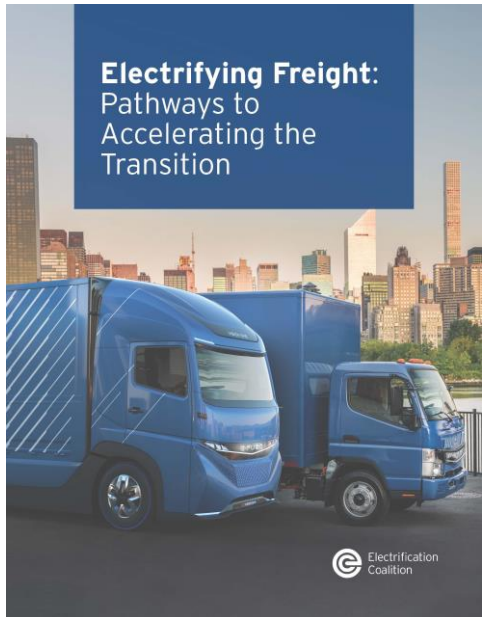
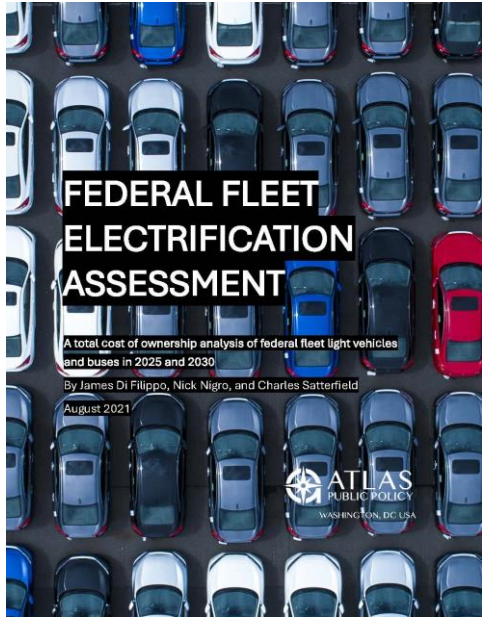
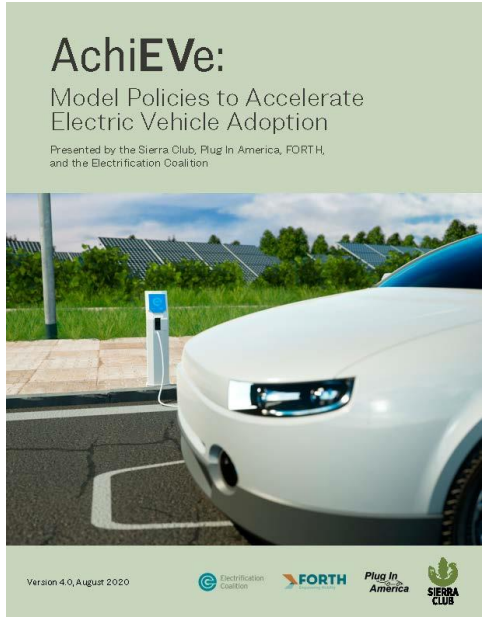
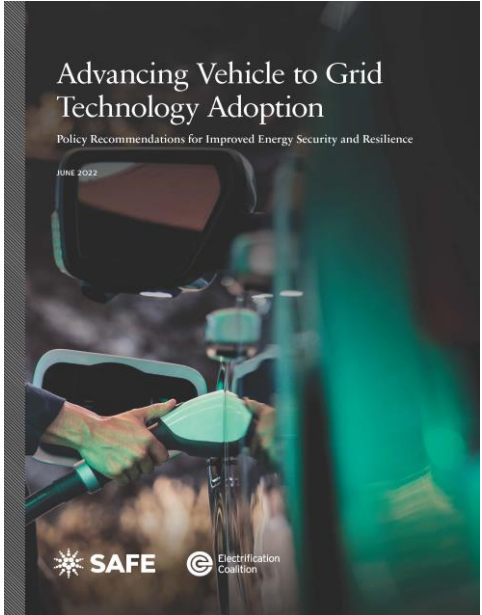
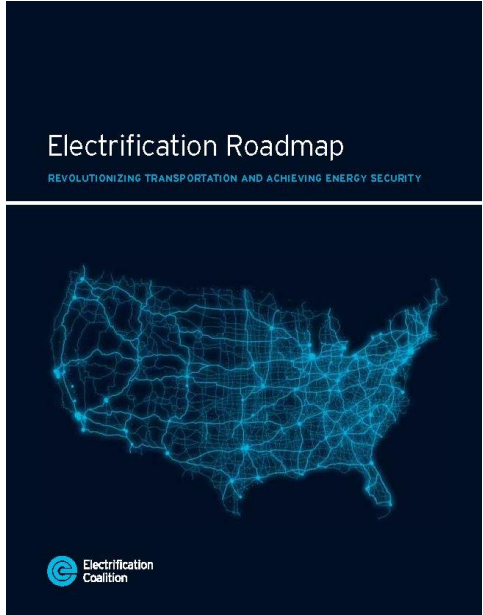
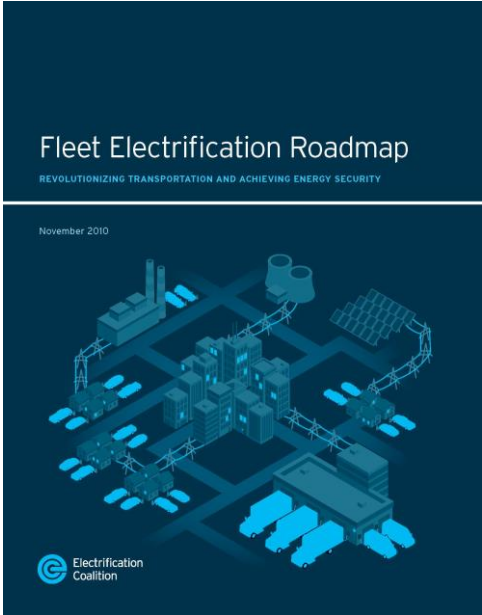
A user-friendly tool to identify federal funding opportunities

The future of transportation is electric, given the massive benefits everyday Americans, businesses, local governments, cities and states stand to gain. Not only does electric transportation save drivers money through stably priced fuel, but it also benefits air quality, public health, and the job market. With unprecedented investment at the federal level to aid in the electric transportation transition, businesses, local governments, cities, and states have an exciting opportunity to participate in this transition. But they must work together.

All of the funding available can make identifying and applying for the proper funding streams daunting. This tool helps eligible recipients sort through available federal funds for transportation electrification and helps recipients understand how investments can be matched. It can also help users identify where technical assistance is available.

Step 1: I represent a...





Explore more resources at www.electrificationcoalition.org

Thank you!

Please connect with our PA team:

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Buckle up and let's get started!



Acting Secretary Rich Negrin, PA Department of Environmental Protection



Dawn Fenton, Vice President of Government Relations & Public Affairs, Volvo Group North America



Dave Althoff, Director of Energy Programs Office, PA Department of Environmental Protection



Colton Brown, Alternative Fuels Coordinator, PA Department of Transportation



Matt Reis, Deputy Director, PA GreenGov Council



Tom Bonner, Manager of State Government Affairs, PECO



Tommy Perkins, President/Owner, T.P. Trailer, Inc.



Mark Carnes, Business Manager & Board Secretary, Steelton-Highspire School District



Tony Bandiero, Executive Director, Eastern PA Alliance for Clean Transportation

**+ many
more**