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PANEL 1:

ELECTRIC VEHICLE INFRASTRUCTURE CHALLENGES AND SOLUTIONS



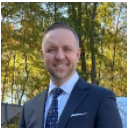



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PANEL 1: ELECTRIC VEHICLE INFRASTRUCTURE CHALLENGES AND SOLUTIONS

PANELISTS

	<p>Brendan K. Collins Ballard Spahr LLP <i>Panel Moderator</i></p>		<p>Tom Bonner PECO</p>
	<p>Vince Cipollone Wawa, Inc.</p>		<p>Derrick Hermann, PE Pennsylvania Department of Transportation – Strategic Development and Implementation Office</p>

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EV INFRASTRUCTURE IN PENNSYLVANIA

12TH ANNUAL GREEN INFRASTRUCTURE CONFERENCE

DERRICK HERRMANN, P.E. • • OCTOBER 30, 2024

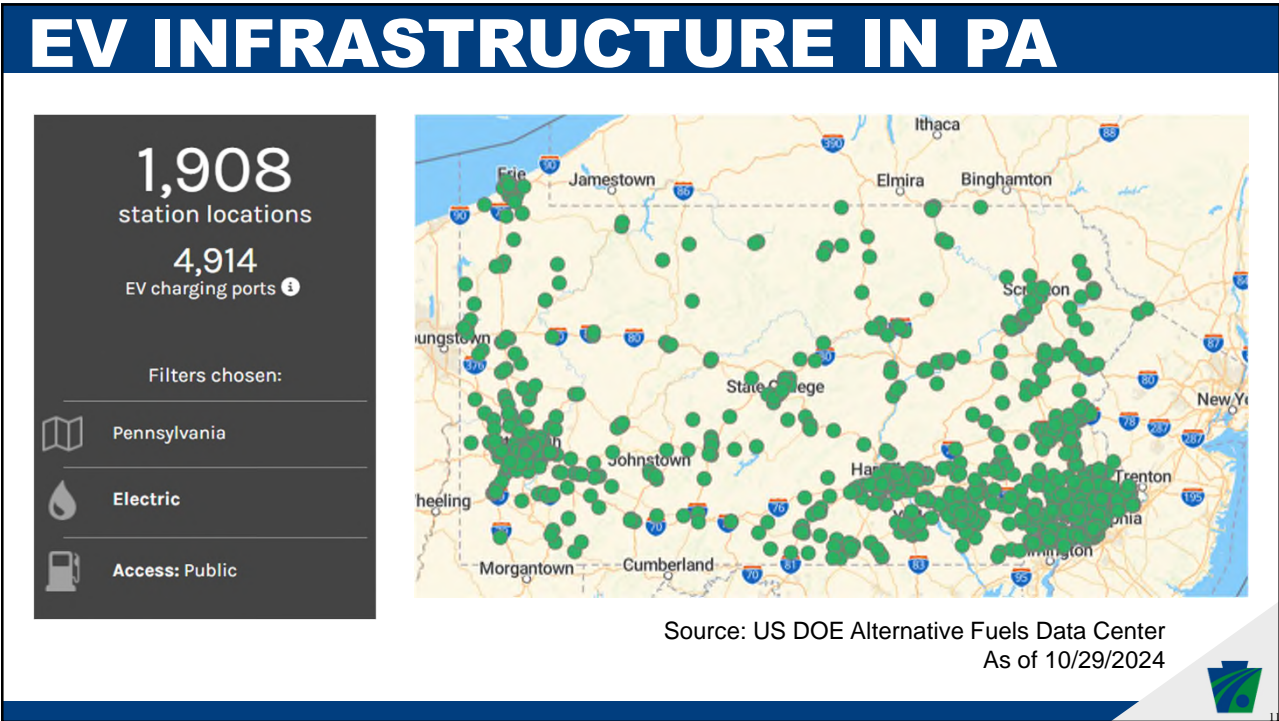
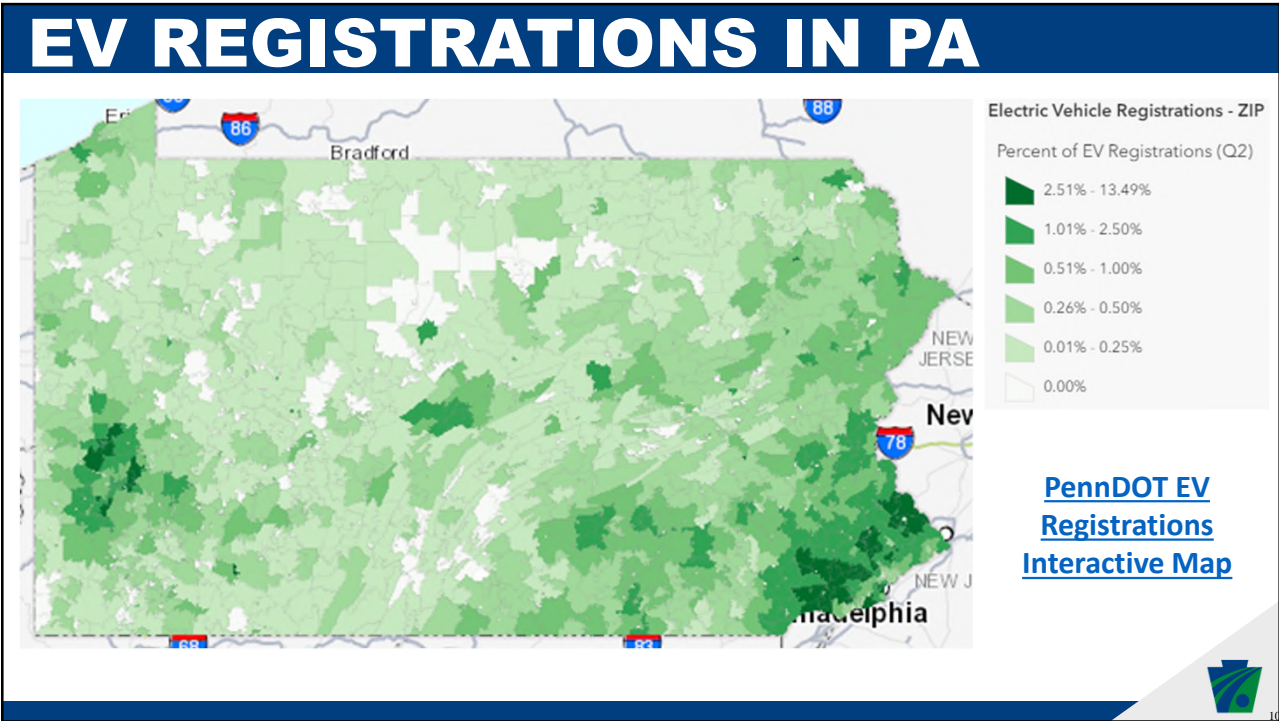


EV REGISTRATIONS IN PA

Fuel type	9/30/2024 Totals	Difference since 8/30/24	Percent Increase since 3/7/23
BEV	79,013	2,932	80.70%
PHEV	45,558	995	91.11%
HEV	321,828	7,544	45.19%
Fuel Cell	3	1	200.00%
Total	446,402	11,472	54.34%

Source: PennDOT registration database





EV FEES

YEAR	ADDITIONAL REGISTRATION FEE
2025	\$200
2026	\$250
2027 and after	Tied to inflation



EV EDUCATION AND FEEDBACK

- Throughout the NEVI program PennDOT has engaged with stakeholders and communities
 - A summary of the Fall 2023 community outreach sessions and outcomes can be found on PennDOT's [NEVI Resources](#) webpage.
- PennDOT is currently developing a guidance document for local governments to ensure safe level 1 charging over public sidewalks.
- PennDOT is working on a series of EV educational videos that will be released early next year
- An online EV training for first and second responders can be found at <https://gmevfirstrespondertraining.com/onlinetraining/>.
- SAE International has released a brand-neutral certification program for charging station technicians. For more details visit [SAE EVSE Technician Certification](#).



NATIONAL ELECTRIC VEHICLE INFRASTRUCTURE (NEVI)



OVERVIEW OF PA'S NEVI FORMULA PROGRAM



\$171.5 Million

Total Pennsylvania NEVI Funds


FFY 2022	FFY 2023	FFY 2024	FFY 2025	FFY 2026
\$25.4 M	\$36.5 M	\$36.5 M	\$36.5 M	\$36.5 M

PA NEVI Plan Annual Updates


PA NEVI Plan Year	For FFY Funding	Plan Submitted	Plan Approved
2022 PA NEVI Plan	FFY 2022, FFY 2023	July 21, 2022	September 14, 2022
2023 PA NEVI Plan	FFY 2024	August 1, 2023	October 4, 2023
2024 PA NEVI Plan	FFY 2025	August 28, 2024	TBD



EV ALTERNATIVE FUEL CORRIDORS





- PennDOT has nominated corridors over 7 rounds - includes interstates and portions of US 30, US 15, Route 1, and Route 422 - over 1,800 miles of roadway
- NEVI funding must be applied to AFCs until a “**Build-Out**” certification by FHWA




YEARS 1-2 CHARGING FOCUS


- DC Fast Charging
- Public
- 4 ports
- CCS Connectors
- At least 150kw power per port (600kw total)
- Within 1-mile of highway, 50 miles of the next station

How to Charge Your EV


	 Charge Time	 Charging Locations
Level 1	3.5 - 6.5 miles Per Hour	Residential, Workplace
Level 2	14 - 35 Miles Per Hour	Residential, Workplace, Destinations
DC Fast Charge	200+ miles Per Hour	Highways, Communities, Destinations



PAST AND CURRENT FUNDING ROUNDS

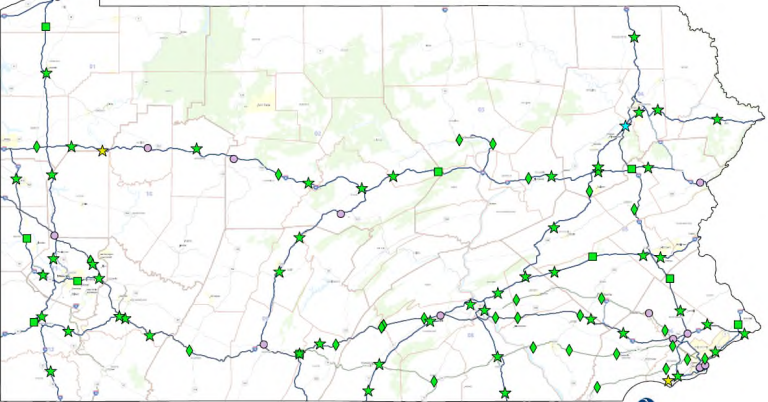


Round of Contracting	Submissions Received	Active Awards	Date Solicitation Released	Date Solicitation Closed	Date of Conditional Award	First Active Site
Round 1	271	52	1/6/23 (Updated 3/13/23)	5/5/23	8/14/23 (Additional 9/21/23)	12/21/23
Round 1A	86	29	11/13/23	1/26/24	4/4/24	TBD
Round 1B	34	10	4/22/24 (Addendum 6/7/24)	7/10/24 (Addendum 8/2/24)	8/15/24	TBD



ROUND 1, 1A & 1B ACTIVE PROJECTS


Electric Vehicle Charging Stations 2024
 National Electric Vehicle Infrastructure (NEVI) Round 1,1A, & 1B Awards



Round 1 Station Status: ★ Planned, ★ In Progress, ★ Operational
 Round 1A Station Status: ◆ Planned
 Round 1B Station Status: ■ Planned
 EV Alternative Fuel Corridors: — Interstate, — US Highway
 Other Funding Sources: ○ Operational (NEVI Creditable Station)

U.S. Department of Transportation Federal Highway Administration
 pennsylvania DEPARTMENT OF TRANSPORTATION

- 91 projects within 43 counties
- \$59.1 million
- 40 projects in or within ½ mile of a Disadvantaged Community
- Typical Project Timeline 18-24 months



OPERATIONAL NEVI STATIONS

3rd State in the Nation with a NEVI Funded Station

- First project opened to the public on December 21, 2023
 - Located at a Pilot Travel Center in Pittston, PA
- Pennsylvania's second NEVI station opened June 5, 2024
 - Located at Emlenton Truck Plaza
- Third NEVI station opened September 17, 2024
 - Located at a Royal Farms in Aston, PA
- 12 additional stations currently in construction



WHAT'S NEXT

- Round 2 – Community Phase
 - Approximately \$102 million available
 - Planning starting now
 - Anticipated to commence in 2025 or 2026
 - Community and stakeholder engagement continues to develop the program.
- DOE E-Construction Equipment Grant
 - PennDOT will deploy and test electric construction equipment on highway construction projects
- EV Charging Reliability and Accessibility Accelerator Program (EVC-RAA)
 - There are 293 eligible charging ports at 174 locations in PA
 - Anticipate between 20 and 50 will receive awards
 - **2nd round opening for applications 11/11/24**







NATIONAL ELECTRIC VEHICLE INFRASTRUCTURE (NEVI)

ROUND 2



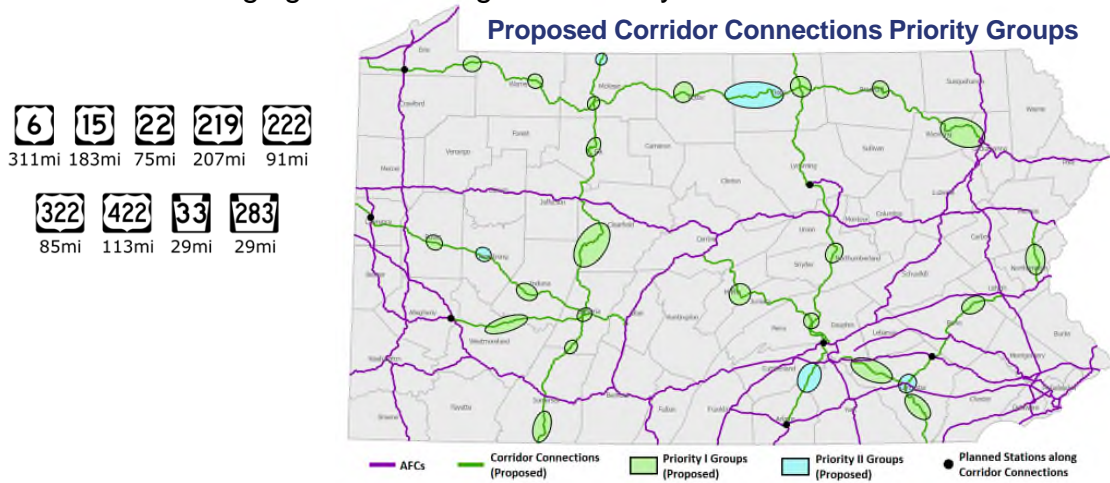
COMMUNITY FRAMEWORK

			
Corridor Connections	Community Charging	Critical Investments	EV Workforce
\$10-15M	\$75-80M	\$5-10M	\$4-6M



CORRIDOR CONNECTIONS: \$10-15 MILLION

- The goal of Corridor Connections is to fill long-distance travel route gaps.
- Each “bubble” in the map below is a portion of roadway where PennDOT will seek to fund a charging station along the roadway.



WHY CORRIDOR CONNECTIONS?

- **Why Corridor Connections?**
 - Many other key long-distance corridors besides AFCs
 - Several DACs remain unserved
- **Corridor Connections informed by:**
 - Routes of Significance from 2022 EV Mobility Plan
 - Gap analysis
 - Origin-Destination analysis
 - Other demand factors
- **Corridor Connections similar in design to AFCs, but rules relaxed**

COMMUNITY CHARGING: \$75-80 MILLION

- The goal of the Community Charging Focus Area is to improve charging access within communities.
- Through a public survey, and via community engagement performed by local transportation planning agencies, PennDOT is gathering feedback on:
 - Charging station features (i.e. accessibility, affordability, safety, etc.)
 - Charging location types (i.e. on-street in downtowns, destinations, etc.)
 - Charging station locations (i.e. specific towns or neighborhoods)
- Local charging station priorities will be incorporated into the competitive funding opportunities



COMMUNITY CHARGING: \$75-80 MILLION

TSMO Region	Planning Partner	Planned Funding (%)	Planned Funding Amount	Planned Regional Funding (%)	Planned Regional Funding Amount
Western	SPC MPO Allegheny County	18 - 20% 9.4 - 11%	\$14 - 16 M \$7.5 - 8.5 M	22 - 25%	\$17 - 20 M
	Northwest RPO	1.5 - 2.3%	\$1.2 - 1.8 M		
	Erie County MPO	1.7 - 2.4%	\$1.3 - 1.9 M		
	Mercer County MPO	0.9 - 1.4%	\$0.7 - 1.1 M		
Central	SEDA-COG MPO	2.2 - 2.9%	\$1.7 - 2.3 M	8.2 - 9.4%	\$6.5 - 7.5 M
	North Central RPO	1.3 - 1.9%	\$1.0 - 1.5 M		
	Southern Alleghenies RPO	1.0 - 1.5%	\$0.8 - 1.2 M		
	Northern Tier RPO	0.9 - 1.4%	\$0.7 - 1.1 M		
	Blair County MPO	0.5 - 0.8%	\$0.4 - 0.6 M		
	Cambria County MPO	0.7 - 1.0%	\$0.5 - 0.8 M		
	Centre County MPO	1.2 - 1.8%	\$0.9 - 1.4 M		
	Lycoming County MPO	0.4 - 0.7%	\$0.3 - 0.5 M		
	Lehigh Valley MPO	4.4 - 5.7%	\$3.5 - 4.5 M		
	Lackawanna Luzerne MPO	3.7 - 4.7%	\$2.9 - 3.7 M		
Eastern	Tri-County MPO	3.7 - 4.7%	\$2.9 - 3.7 M	28 - 33%	\$22 - 26 M
	Lancaster County MPO	3.2 - 4.2%	\$2.5 - 3.3 M		
	NEPA MPO	3.2 - 4.2%	\$2.5 - 3.3 M		
	Berks County MPO	2.8 - 3.7%	\$2.2 - 2.9 M		
	York County MPO	2.8 - 3.7%	\$2.2 - 2.9 M		
	Franklin County MPO	0.8 - 1.3%	\$0.6 - 1.0 M		
	Lebanon County MPO	1.0 - 1.5%	\$0.8 - 1.2 M		
	Adams County MPO	0.5 - 0.8%	\$0.4 - 0.6 M		
	Wayne County	0.3 - 0.5%	\$0.2 - 0.4 M		
	DVRPC MPO	34 - 42%	\$27 - 33 M		
Southeastern	Philadelphia County	18 - 23%	\$14 - 18 M	35 - 40%	\$28 - 32 M



COMMUNITY CHARGING: \$75-80 MILLION

	2024		2025		AFC FBO				
	Q3	Q4	Q1	Q2	Q1	Q2	Q3	Q4	Q4+
1. Program Development and Outreach	■	■							
2. Community Charging Use Rankings and Community Priority List Development		■	■	■					
3A-B. Community Charging Funding Opportunity – Development				■					
3C-E. Community Charging Funding Opportunity – Release and Selections					■	■			
4. Post-Selection Activities							■	■	■
5. Follow-Up Rounds as Funding Remains								■	■

Example Community Charging Initiatives

- On-Street Charging in Downtowns
- Parking Lots in Cities and Towns
- Multi-Unit Dwelling Charging Solutions
- Destination Charging (e.g., parks, recreation, events)
- Planning Partner specific focus areas

No.	Community Charging Initiative Type	Priority Scale
DVRPC – 10001	On Street Charging in Downtowns	1

No.	Communities (Zip Code, City, County, Description)
DVRPC – C0001	Downtown Norristown, Montgomery County



CRITICAL INVESTMENTS: \$5-10 MILLION

- The goal of the Critical Investments Focus Area is to fund important charging locations and types that may not be adequately addressed in the other focus areas.
- Examples could include:
 - EV charging stations for commercial medium- and heavy-duty vehicle charging
 - EV charging stations at PennDOT park-and-ride facilities
 - EV charging stations at state owned public facilities (e.g., state parks, CareerLink locations)

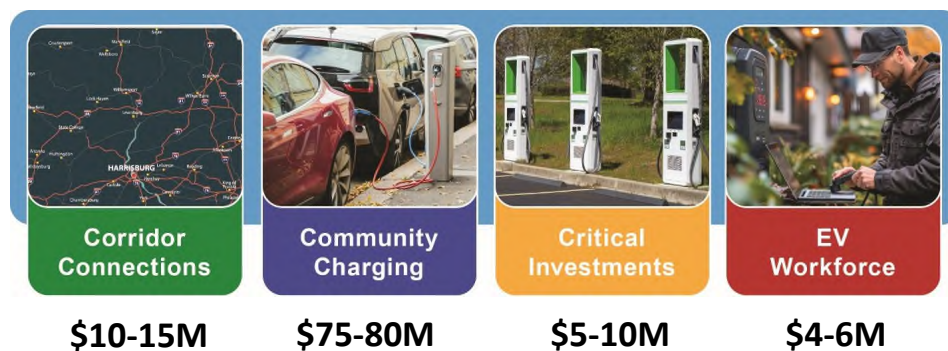


EV WORKFORCE: \$4-6 MILLION

- PennDOT is currently exploring methods to support EV charging workforce development to train or upskill workers to be able to enter the fields related to EV charging.
- Leading workforce funding areas include:
 - Supporting EVSE technician certification programs
 - Community and technical college training programs
 - Physical cybersecurity training programs
 - Purchasing or renting equipment to supply to training programs



COMMUNITY FRAMEWORK



THANK YOU

Follow the Transformational Technology Division

penndot.pa.gov/av

PennDOT CAV team contact:

ra-pdavptf@pa.gov

penndot.pa.gov/ev

PennDOT EV team contact:

ra-pdevcorridors@pa.gov

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Pennsylvania
Department of Transportation



October 30, 2024

Opportunities and Challenges for a ZEV Future

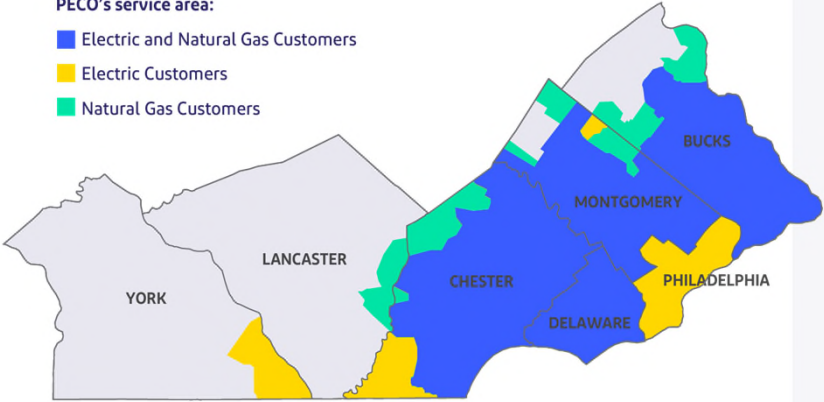
Tom Bonner, Sr. Manager, State Government Affairs



Who We Are

PECO's service area:

- Electric and Natural Gas Customers
- Electric Customers
- Natural Gas Customers



- 2,100 square miles
- 1.7 million electric customers
- 553,000 natural gas customers
- 10% commercial/industrial
- 90% residential

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Our Path to Clean

Within PECO and across the Exelon utilities, we are on a Path to Clean, building on emission reduction goals currently in place and transitioning to a cleaner energy future. Our Path to Clean includes goals to:

- Cut operations-driven emissions in half by 2030
- Achieve net-zero operations-driven emissions by 2050
- Support customers and communities in reaching their clean energy goals



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Support for Transportation Electrification

- PECO has been a leading stakeholder in Pennsylvania promoting transportation electrification for more than a decade, including serving as one of the anchor participants in the Drive Electric PA coalition
- The company:
 - Funded the earliest regional EV adoption forecasts developed in the state
 - Hosts major stakeholder and public education EV education events
 - Offers incentives for EV infrastructure development and TOU rates for EV owners
 - Provides a web-based EV Customer Toolkit
 - Assists legislators in the development of proposals to authorize utility investments in EV infrastructure
- PECO has also developed internal subject matter experts (SMEs) who specialize in working with customers developing large EV infrastructure projects

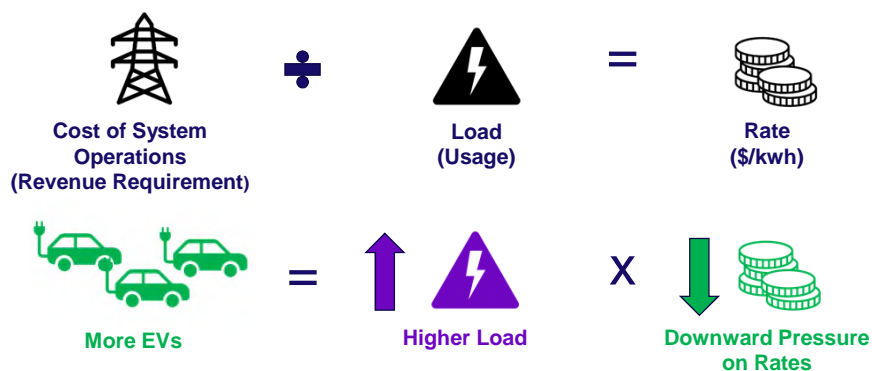
Learn more about PECO incentives at:

<https://www.peco.com/smart-energy/innovation-technology/electric-vehicles-l3>.



Electric Vehicles Save All Utility Customers \$\$\$

Setting Electric Rates is Complicated, but the Basics are Simple

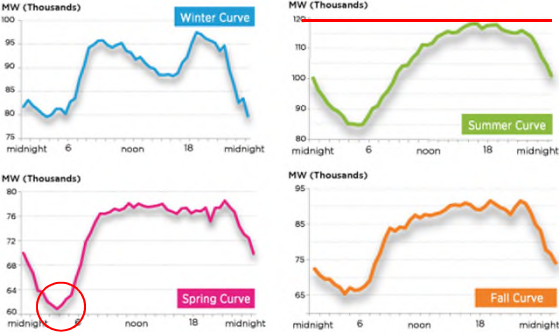


An average all-electric vehicle can contribute more than *\$200 per year to meeting the cost of maintaining reliable electric service, putting downward pressure on everyone's electric rates

*Based on electric distribution and transmission rates for a battery electric vehicle driving 12,000 miles per year



Electric Vehicles Make More Efficient Use of the Electric Grid



Distribution load peaks in the late afternoon on a hot summer day, but falls to almost half that level on an early spring morning

Utility systems are built to meet system peaks, leaving available capacity at almost all times for EV load

Through tools like Time-of-Use Rates and Demand Management programs, utilities and their customers can make more efficient use of the grid and avoid the need for capacity increases

Graph source: PJM Learning Center - How Energy Use Varies with the Seasons



Navigating the Roadmap



Typical Power Requirement Timelines



Power (MWs)	Equipment	Description	Timeline
125 kW	Switching/cap bank	Minimal on/off property work is needed to accommodate the capacity requirement	2-4 months
500 kW	Install new transformer or extend feeder	Minor on/off property work is needed to accommodate the capacity request	3-6 months
2 MW	New medium voltage feeder	New feeder extension is required to accommodate additional capacity	9-12 months
6 MW	Two new feeders (medium or high voltage)	Construct or extend multiple feeders to customer site	12-15 months
12.5 MW	Multiple new feeders (medium or high voltage)	Depending on load, may build or extend feeders to customer site	12-18 months
25 MW	Multiple new high voltage feeders	Load will likely warrant multiple high voltage feeders and potential substation work	24+ months

Please contact your PECO Large Customer Service representative that is noted on your invoice, or email EVBusiness@peco.com for more information if your organization doesn't have an LCS manager



Early engagement with PECO is critical to your project's success



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Interconnection Analysis Form

Utility Company Name:

DESCRIPTION	TOTAL COST & TIMELINE
High-level Engineering & Construction Cost & Time Estimate	\$
(This high-level cost* and time estimate** includes Power Transformer, terminator pole, if applicable, Service Lateral or conductor and Metering.)	Timeline:
*Cost estimate to be covered by Site Applicant.	
**Time estimate is from the time of official service request and subject to change.	
Additional Engineering & Construction Costs/Time Estimates	\$
(These estimates include additional time and costs for primary line extension to customers' location and upgrades required to accommodate new load.)	Timeline:
Site Applicant construction responsibilities for electric distribution service	\$
Electric Distribution Company (EDC) construction responsibilities for electric distribution service	-\$
Total Estimated Timeline for Site Applicant:	
Total Estimated Cost to Site Applicant:	\$



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Green Infrastructure Conference

Vince Cipollone
 10-30-2024

Wawa footprint expanding from six to fourteen states...



Q2 2024
FLORIDA PANHANDLE
NORTH CAROLINA

Q3 2024
SOUTHERN ALABAMA
GEORGIA

Q4 2024
VIRGINIA
CENTRAL PENNSYLVANIA

Q2 2025
OHIO
INDIANA

Q1 2027
KENTUCKY
WEST VIRGINIA

2030
TENNESSEE NASHVILLE

Starting in 2025, over **50%** of New Stores will open these market

- Mid-Atlantic Region
- Midwest Region
- Southeast Region



EV charging at Wawa



Wawa Fuel & EV Charging

Always conveniently located, priced competitively, and backed by our quality guarantee. Let's power your day!

Explore Our Options

175+ charging locations



Competing for parking



Considerations & challenges

- Parking & ADA compliance
- Landlords
- Utility easements
- Charging adapter standards
- Payments
- Integrating technology
- Business case: host vs. own
- Grant funding





Thank you!