PATH TO ZERØ

FLEET ELECTRIFICATION WORKSHOP

Weston Hall, New Jersey Institute of Technology

October 16, 2024



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Executive Director
New Jersey Clean Cities Coalition


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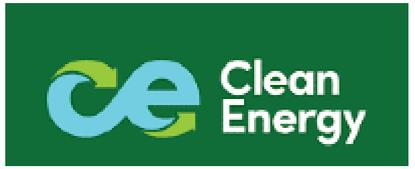

KEMA Labs


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Gage Zero


Clean
Energy


renewable
connections

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FLEET ELECTRIFICATION WORKSHOP

Upcoming Event 10/29/2024



PATH TO ZERØ

FLEET ELECTRIFICATION WORKSHOP

Register Here

Upcoming Event 11/19/2024



ANNUAL STAKEHOLDERS MEETING

11.19.2024
Tuesday, 5PM - 7PM

Crown Ballroom 2
Sheraton, Atlantic City

SPONSORSHIPS ARE AVAILABLE!

ACUA
Atlantic County Utilities Authority

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Dr. Teik C. Lim
President
New Jersey Institute of Technology

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Jim Hineson
General Maintenance & Supervisor
Port Authority of New York and New Jersey



Robert Martinez
Retired Deputy Commissioner
NYPD

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FLEET ELECTRIFICATION WORKSHOP



Erin Andrews-Sharer
Transportation Planner/ Project Lead, Analysis of Vehicle and Infrastructure Deployment Group, Center for Integrated Mobility Sciences
National Renewable Energy Lab (NREL)



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Federal Fleet Project Manager
National Renewable Energy Lab (NREL)



Caroline McCallum
Co-Director
New Jersey Clean Cities Coalition

U.S. DEPARTMENT OF ENERGY

Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

Preparing for Your Journey: Fleet Programs and Resources

Erin Andrews-Sharer, Emily Kotz, NREL
Caroline McCallum, New Jersey Clean Cities



State and Alternative Fuel Provider Fleet Program

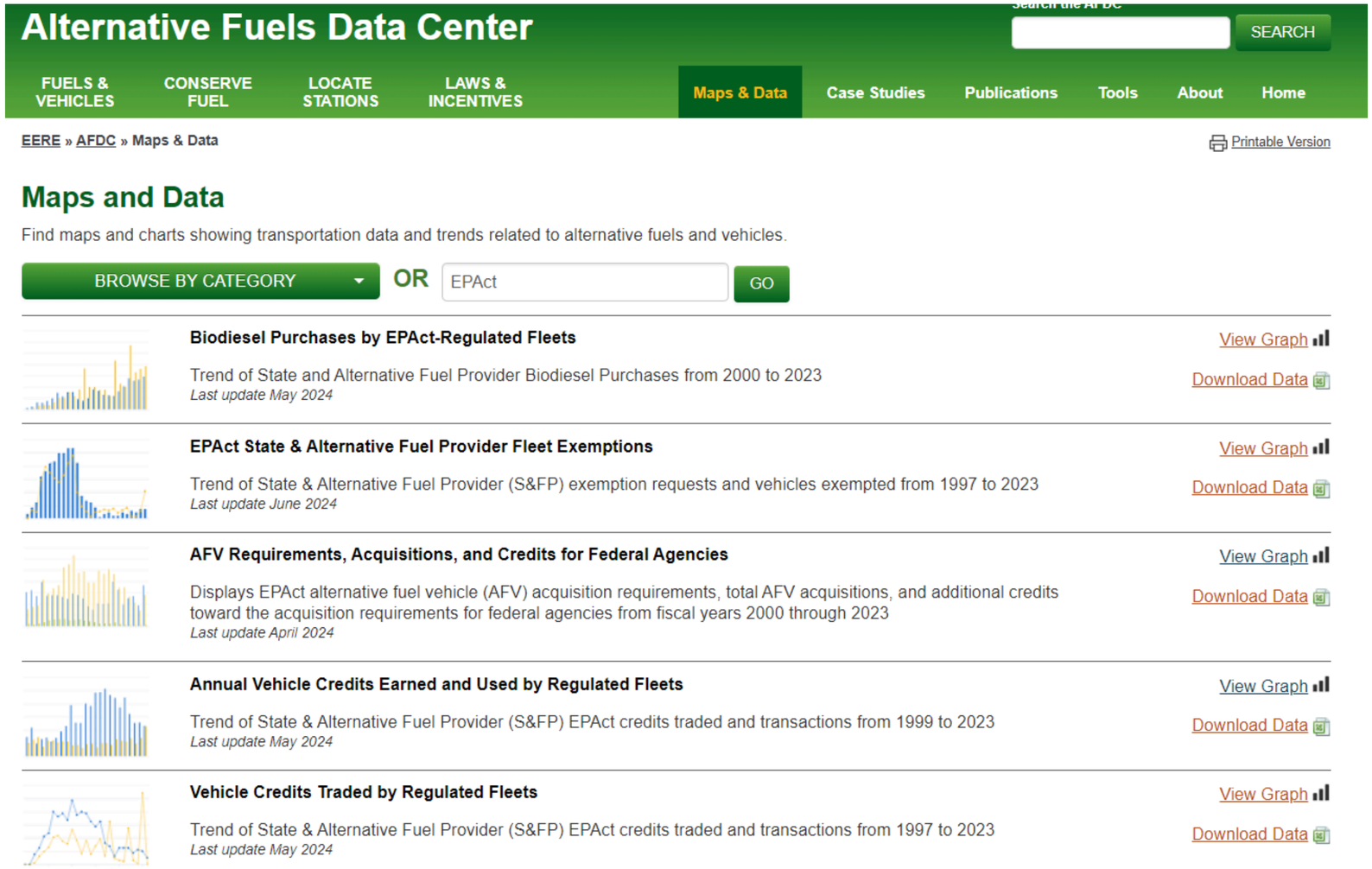
- Fleet compliance program created by Energy Policy Act (EPAct) of 1992, as amended
  - "Covered" state and alternative fuel provider fleets must meet requirements
  - Program focuses on acquisition of light-duty alternative fuel vehicles (AFVs) and petroleum reduction
- Two compliance options
  - Standard Compliance (SC)
    - Focus is on AFV acquisition
  - Alternative Compliance (AC)
    - Focus is on petroleum reduction
- 300+ reporting fleets in the Program today

Alternative Fuels: *

- Biofuels
- CNG
- Propane
- Hydrogen
- Electricity
- Pure B100
- Renewable diesel
- P-series fuels

* As defined by Program

State of the Program - Data

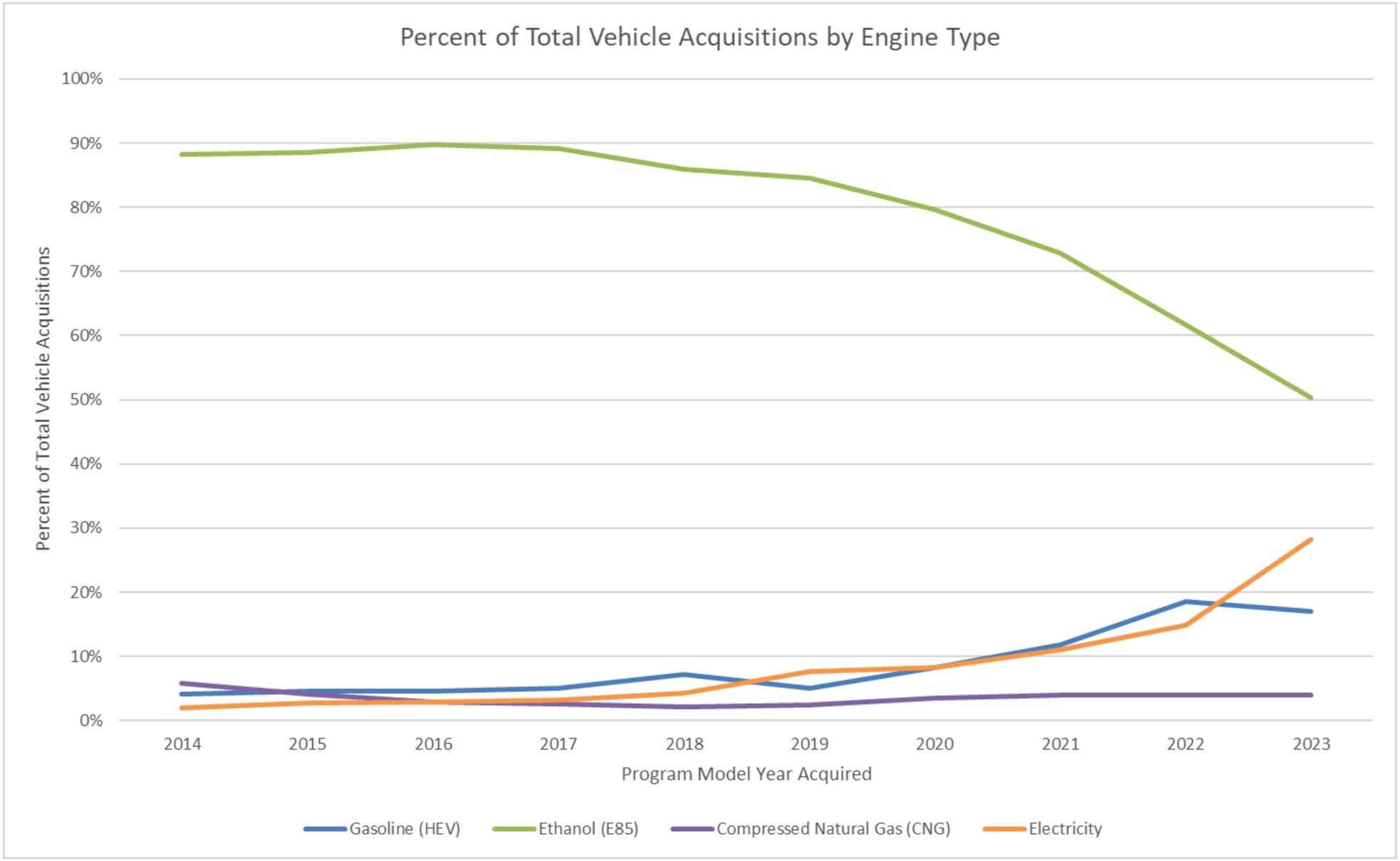


https://afdc.energy.gov/data/search?q=EPAct



https://epact.energy.gov/program-annual-reports

Vehicle Acquisition - Engine Type



$32 million investments in EV charging infrastructure (2023 reporting year)

SAFP Program Support

- Resources for compliance
  - Webinars, guidance documents
  - Direct assistance
- Electrification workshops
- CC&C and federal fleet connections
- Technical assistance/ analysis support (pilot)
- Case studies





DOE FEMP Fleet Management Program

- FEMP helps the federal fleet community access the latest information, applications, and resources related to fleet efficiency and electrification.

- FEMP provides guidance and assistance to help agencies implement federal legislative and regulatory requirements mandating reduced petroleum consumption and increased alternative fuel use.



FEMP Federal Fleet Support

Direct assistance, resources, and tools are available for these topics:

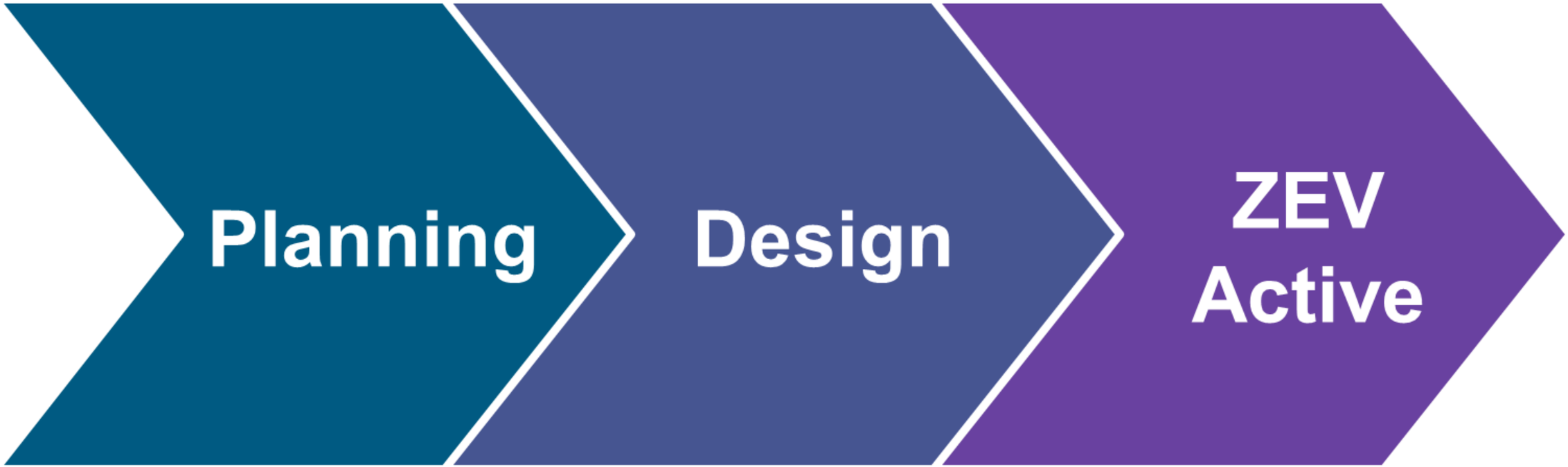
- Statutory Requirements
- Fleet Data
- AFV Candidates
- EV Technology Training
- EVSE Installation Planning
- Workplace Charging Programs
- Cybersecurity Considerations
- Best Practices and Case Studies



Simplify Fleet Electrification

The ZEV Ready Solution

Framework to simplify and guide fleets through the process to electrify each fleet location



Federal Fleet ZEV Ready Center

15 process steps organized in 3 phases – Planning, Design, ZEV Active



https://www.energy.gov/femp/federal-fleet-zev-ready-center

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 and Communities

Strategically Advance Clean Transportation

Access technical assistance and hands-on problem-solving support.



Connect to unbiased, data-driven tools and resources



Build partnerships



Receive personalized experience rooted in local context



Collaborate on funding opportunities



Technical and Problem-Solving Assistance:

Long-Term Commitments to Community

- New Jersey Clean Cities Coalition launched electric ride share program
- Years-long process to build trust and gain buy-in from local leaders
- Committed guidance and expertise from NREL's technical assistance team.



Connect to Funding Opportunities

- Coalitions are a go-to resource to help navigate federal funding opportunities.
- Coalitions provide insights to DOE about on-the-ground needs that can help inform funding priorities.

https://cleancities.energy.gov/funding-opportunities/

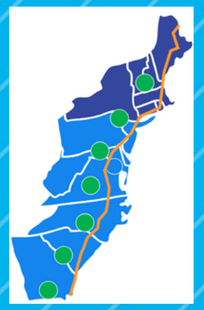
NJ Clean Cities Projects













EMPOWER

Drive4 Data

ESB Initiative

Drive Electric NJ

East Coast ZEV Corridor

Eco Patrol

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Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

Laying the groundwork: Tools to Help Get Started

Erin Andrews-Sharer, NREL
Emily Kotz, NREL
Matt Bradley, ICF



Fleet Electrification Process

Building a Team

Electric Vehicle Suitability

EV Charging Infrastructure Needs

Utility Coordination

Site Assessment

Operations

Example Scenario - Setting the Stage

- A state agency has 20 vehicles
  - 10 assigned admin vehicles
  - 5 vehicles used on two shifts for inspections
  - 5 motor pool vehicles

- Average radius of the metropolitan area is 20 miles

- The agency implemented telematics 3 years ago and are now looking to electrify their fleet per a state mandate

Building a Team

Every Project Needs an EV Champion

Develop an elevator pitch

- Why should you do it
- What are the benefits
- Why it can work for you

Be the expert

- https://afdc.energy.gov/
- Subscribe to newsletters
- Read up on new products
- Attend conferences
- Read new stories

Have a plan

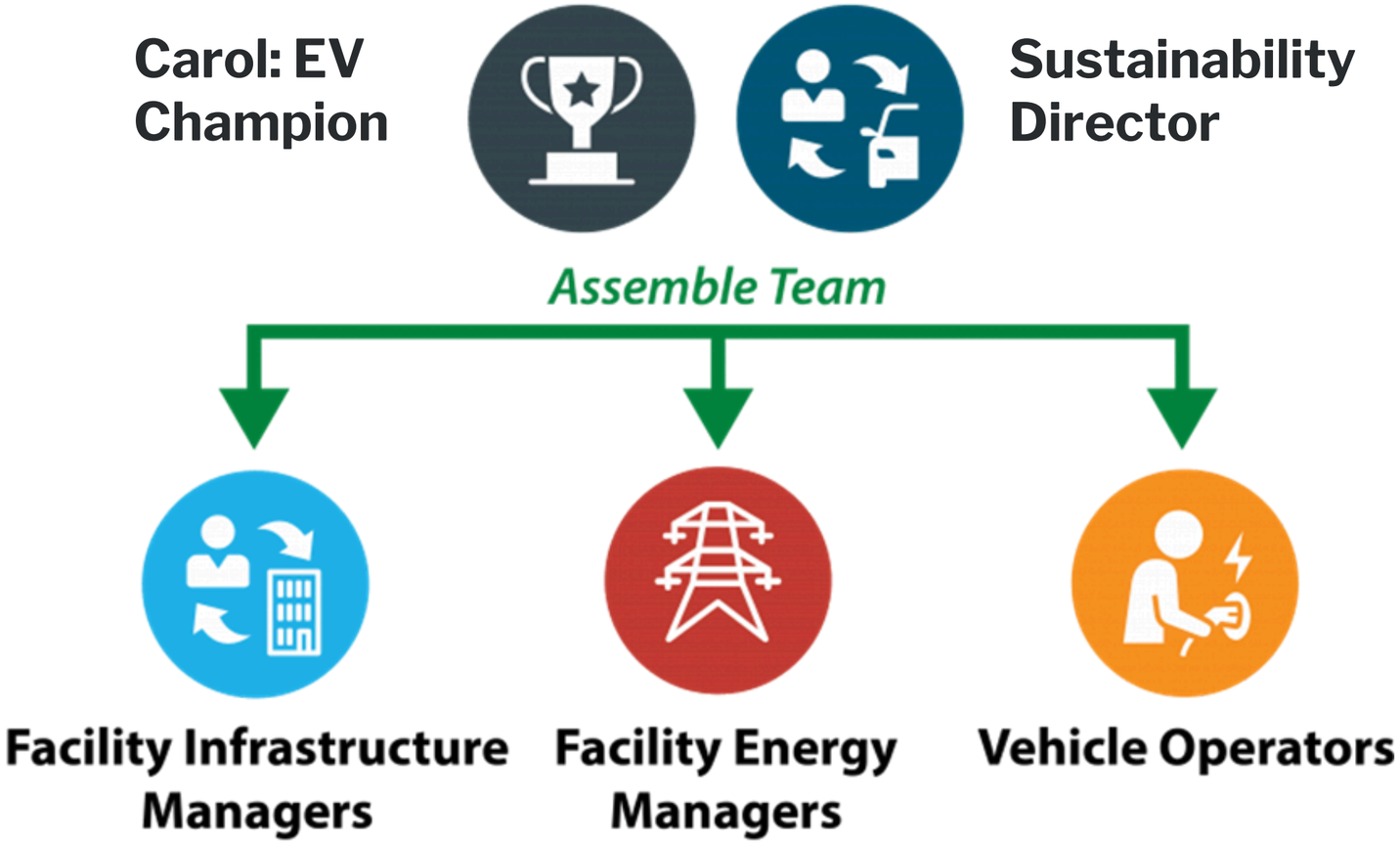
- Understand applicability/operations
- Develop a replacement strategy or criteria
- Understand your fleet and data
- Understand charging infrastructure requirements

Successful EV Fleets Have A Champion



It’s a Team Effort

- Identify and assemble the team
- Process requires strong and frequent collaboration
- Led by EV Champion
- Core team and leadership support



Who Else May Need to Be Involved?

- Contracting and Procurement
- Sustainability Leadership
- Local Utilities
- Cybersecurity
- Site Engineers and Planners
- Fire Marshal

EV Suitability

Data is Key!

Vehicle Specific Data

- Yr/Make/Model
- Odometer/Hour Meter
- Life Expectancy
- Class/Weight
- Asset#/License/Identifier
- Drivetrain
- Fuel Type

Ownership Data

- Department/Sub-Dept.
- Parking Location (details)
- Acquisition Cost
- Acquisition Date
- Emergency/Special Usage
- Availability

Usage Data

- Average Daily Mileage
- Max Daily Mileage
- Hours of Operation
- Tow Capacity
- Right-size Candidate
- Dwell Time

Annual Cost Data

- Fuel
- Maintenance
- Repair
- Parts/Labor
- Accidents
- Warranty
- Insurance
- Bill Back

Spreadsheet expertise is essential!

- Understand formulas like vlookup, iferror, sumifs, etc.
- youtube and google are your friend

Example Scenario - Fleet Data

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Plate	Asset ID	Year	Make	Model	Vehicle Type	PrimaryFuel Type	Current Mileage (Odometer)	Current MPG	VIN	Average Annual Miles	Avg. Days in Service (Yr)	Average Daily Miles	Peak M
2	MNJ8752	A01	2016	Ford	C-Max Hybrid	Hatchback Sedan	Gasoline	65,560	26.4	1FADP5AU3GL109076	8,195	222	36.9	61
3	MNJ4875	A02	2018	Ford	C-Max Hybrid	Hatchback Sedan	Gasoline	54,156	27.8	1FADP5AU3GL109077	9,026	235	38.4	68
4	MNJ7489	A03	2018	Ford	C-Max Hybrid	Hatchback Sedan	Gasoline	56,288	26.2	1FADP5AU1JL102425	9,381	227	41.3	50
5	MNJ2007	A04	2020	Chevrolet	Equinox	Compact SUV	Gasoline	22,801	20.3	2GNAXUEV6L6223335	4,560	243	18.8	46
6	MNJ6144	A05	2021	Ford	Escape Hybrid	Compact SUV	Gasoline	32,218	25.7	1FMCU9CZ7MUB01711	10,739	248	43.3	79
7	MNJ4512	A06	2021	Ford	Escape Hybrid	Compact SUV	Gasoline	24,640	26.2	1FMCU9CZ7MUB01712	8,213	198	41.5	75
8	MNJ6241	A07	2022	Ford	Escape Hybrid	Compact SUV	Gasoline	27,788	27.6	1FMCU0BZ1NUA86749	13,894	241	57.7	72
9	MNJ7555	A08	2022	Ford	Escape Hybrid	Compact SUV	Gasoline	30,541	27.1	1FMCU0BZ1NUA86748	15,271	242	63.1	92
10	MNJ2120	A09	2023	Chevrolet	Equinox	Compact SUV	Gasoline	15,486	22	3GNAXTEG3PL246505	7,743	237	32.7	45
11	MNJ1800	A10	2023	Ford	Escape Hybrid	Compact SUV	Gasoline	5,147	27.5	1FMCU9MZ5PUA56612	5,147	165	31.2	44
12	MNJ4632	INSP1	2016	Ford	F150	.5 Ton Pickup Truck (Ext. Cab)	Gasoline	146,258	13.4	1FTEX1EP4GFA37699	18,282	305	59.9	80
13	MNJ154	INSP2	2016	Ford	F150	.5 Ton Pickup Truck (Ext. Cab)	Gasoline	131,618	12.9	1FTEX1EP4GFA37698	16,452	308	53.4	83
14	MNJ58	INSP3	2022	Ram	ProMaster City	Compact Cargo Van	Gasoline	10,256	18.8	ZFBHRFCB4N6Y01983	10,256	221	46.4	55
15	MNJ6338	INSP4	2022	Ram	ProMaster City	Compact Cargo Van	Gasoline	9,045	18.2	ZFBHRFCB4N6Y01982	9,045	248	36.5	39
16	MNJ5523	INSP5	2023	Chevrolet	Silverado 1500	.5 Ton Pickup Truck (Ext. Cab)	Gasoline	18,526	19.4	3GCNDAEK9PG104843	18,526	298	62.2	75
17	MNJ97	MP1	2014	Toyota	Prius Hybrid	Hatchback Sedan	Gasoline	34,987	28.7	JTDKN3DU5E1816745	3,499	100	35.0	55
18	MNJ236	MP2	2014	Toyota	Prius Hybrid	Hatchback Sedan	Gasoline	45,365	28.2	JTDKN3DU5E1816744	4,537	125	36.3	62
19	MNJ2005	MP3	2015	Toyota	Prius Hybrid	Hatchback Sedan	Gasoline	36,852	29.3	JTDKN3DU6F1881542	4,095	102	40.1	48
20	MNJ9912	MP4	2017	Ford	Escape	Compact SUV	Gasoline	42,277	20.5	1FMCU0F70HUA09027	6,040	168	35.9	52
21	MNJ4777	MP5	2017	Ford	Escape	Compact SUV	Gasoline	43,651	21.3	1FMCU0F70HUA09026	6,236	156	40.0	49
22														

- You have the data, but how do you make it actionable to inform your fleet electrification plan?

Identify EV Candidates

Light Duty



Medium Duty



Heavy Duty



Off-Road

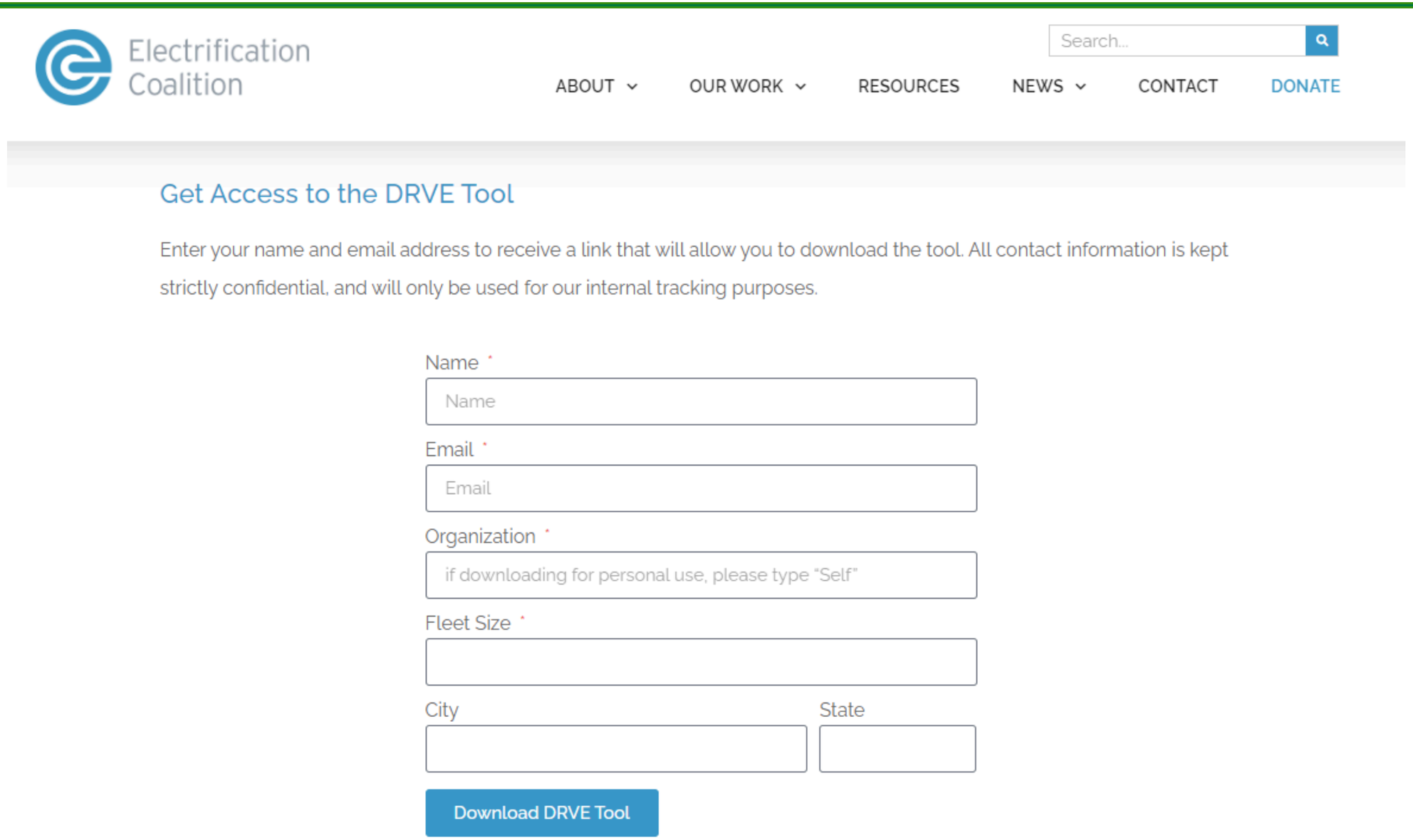


Understand Operations
- Talk with operators, supervisors, etc.
- Verify with data

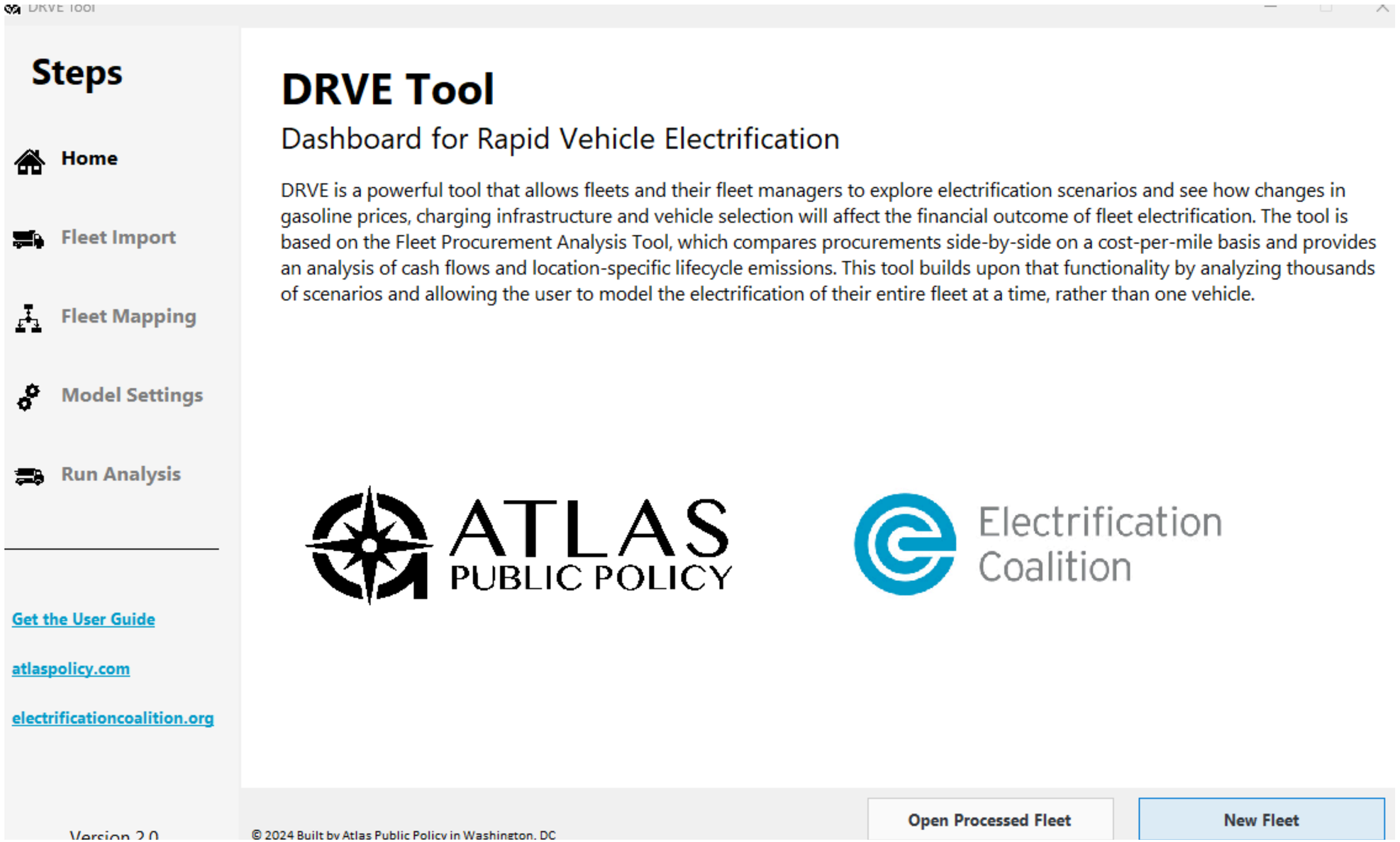
Research Available Options
- Clean Cities & Communities / Peer Fleets
- Understand EV Capabilities

Search Tools
- AFDC Vehicle Search Tool
- CALSTART ZETI Tool
- Climate Mayors EV Purchasing Collaborative

Example Scenario: DRVE 2.0



Example Scenario: DRVE 2.0



Example Scenario: DRVE 2.0

DRVE Tool

Steps

- Home
- Fleet Import
- Fleet Mapping
- Model Settings
- Run Analysis

Get the User Guide

atlaspolicy.com

electrificationcoalition.org

Version 2.0

Fleet Vehicle Mapping

This tool maps your fleet vehicles to a database of vehicles we have information on. In cases where a match isn't found, a default vehicle will be used based on the vehicle class. This section allows you to provide a custom mapping for each vehicle by selecting a different vehicle or adjusting the vehicle settings. You may save this mapping to be used in later analyses.

Unique Vehicles Found in Your Fleet (Count)

- CHEVROLET SILVERADO (1)
- FORD F-150 (2)
- TOYOTA PRIUS (3)
- FORD C-MAX (3)
- CHEVROLET EQUINOX (2)
- FORD ESCAPE (7)
- RAM PROMASTER CITY (2)

Baseline Replacement Vehicle



2023 CHEVROLET SILVERADO 2WD GAS

Class:	Passenger Vehicles (Light-Duty)
Use Case:	Light Pickup
MSRP/Price ($):	$36,300
Fuel Econ (MPG) [City/Hwy]:	17/21
Fuel Econ (MPGe) [City/Hwy]:	N/A
State Incentive ($/Vehicle):	$0.00

Edit

Electric Alternative Vehicle



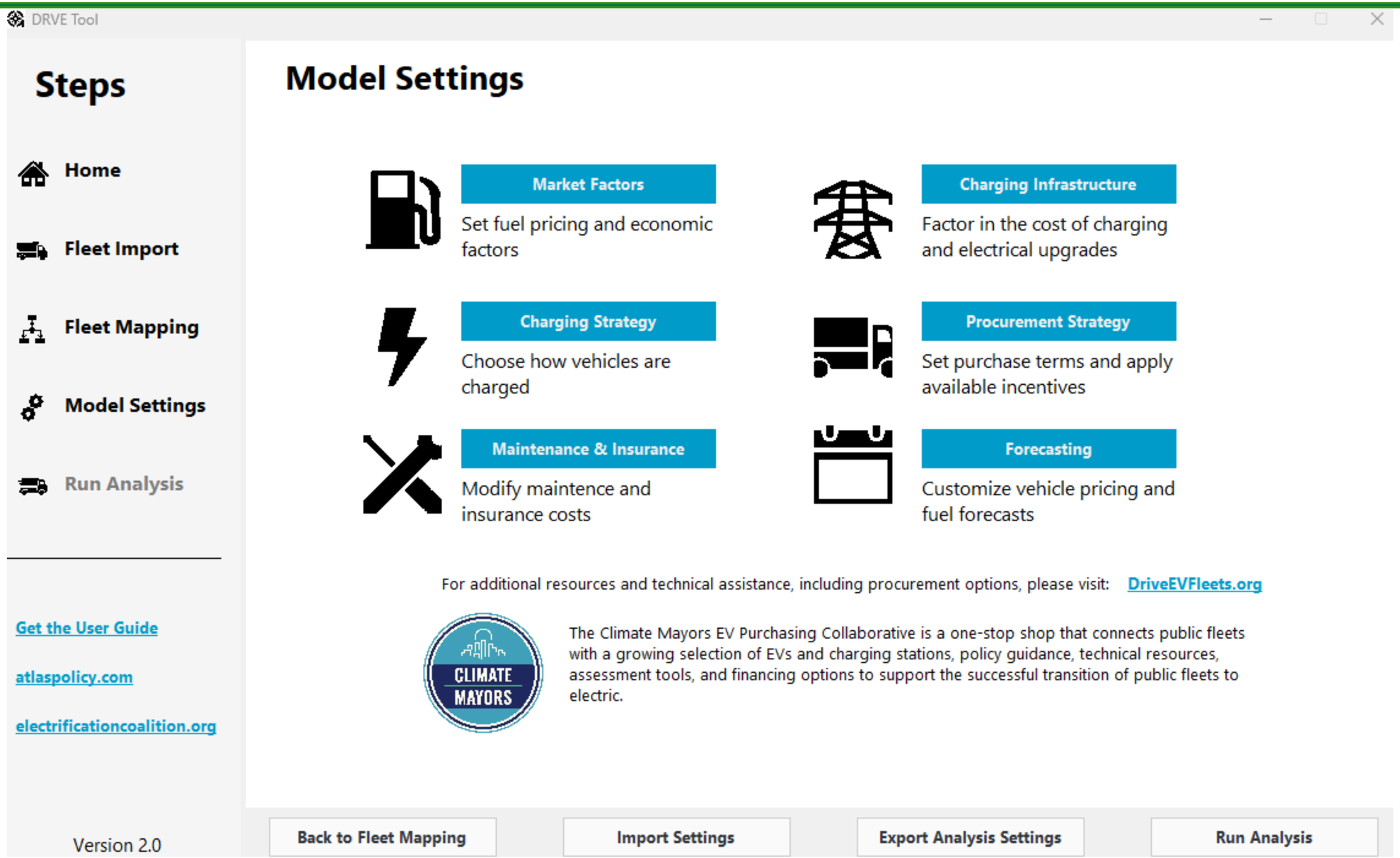
2023 FORD F-150 LIGHTNING 4WD BEV

Class:	Passenger Vehicles (Light-Duty)
Use Case:	Light Pickup
MSRP/Price ($):	$49,995
Fuel Econ (MPG) [City/Hwy]:	N/A
Fuel Econ (MPGe) [City/Hwy]:	76/61
State Incentive ($/Vehicle):	$0.00

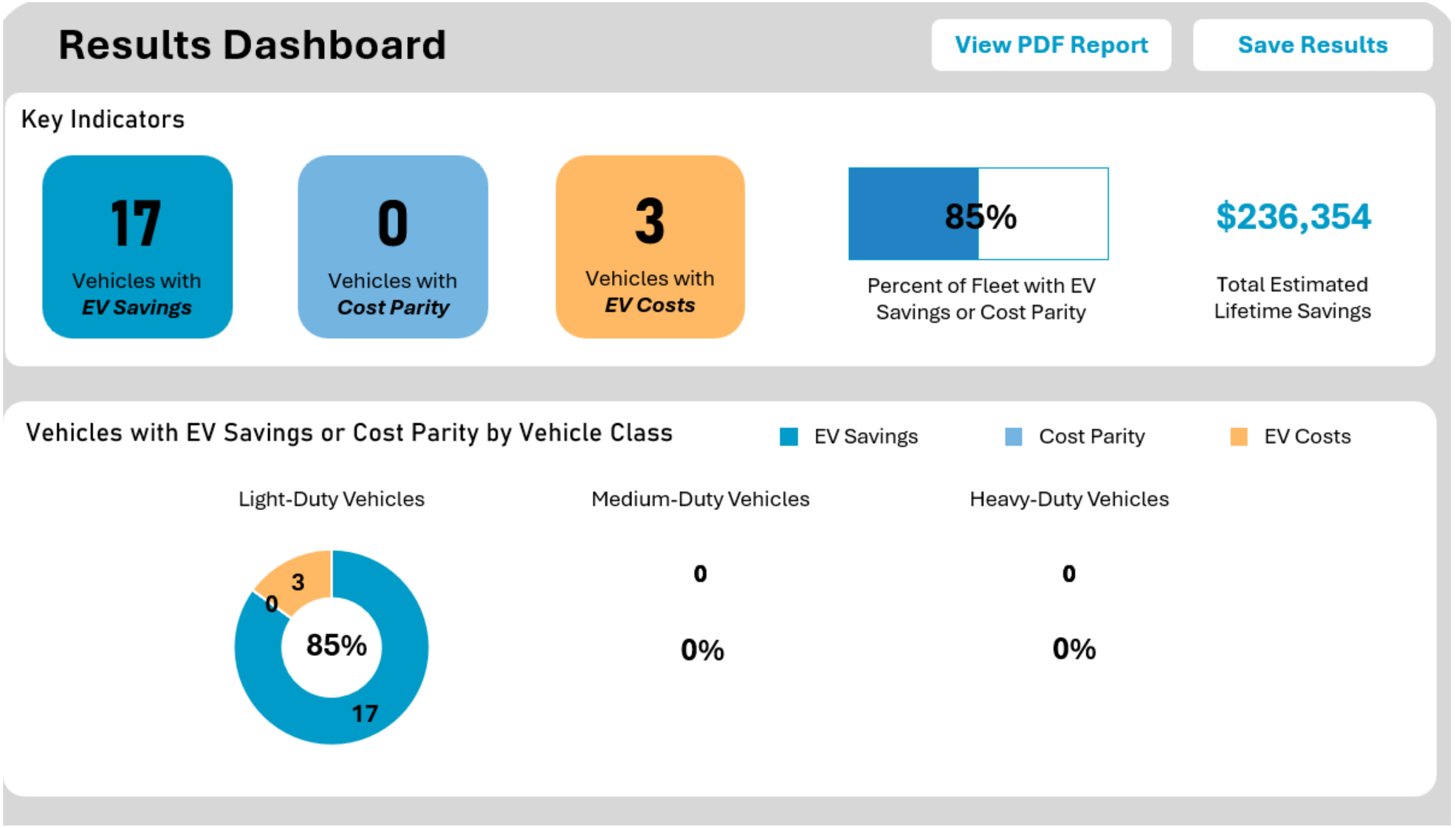
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Back | Save Processed Fleet | Next

Example Scenario: DRVE 2.0



Example Scenario: DRVE 2.0



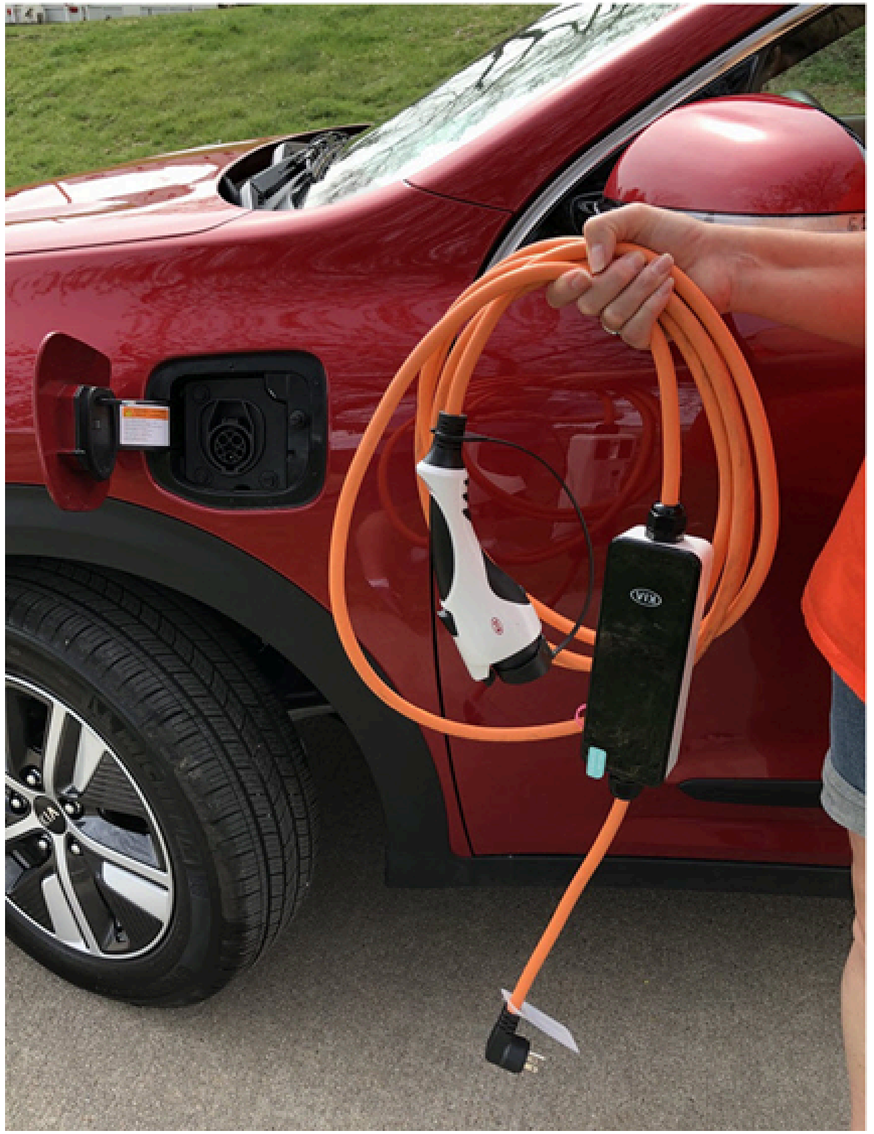
Example Scenario: DRVE 2.0

Conventional Replacement	Electric Replacement	Count	Conventional Average NPV	Electric Average NPV	Average EV NPV Savings	Average Percent Savings from EVs	Conventional Average Cost per Mile
2024 CHEVROLET TRAX GAS	2023 FORD MUSTANG MACH-E RWD LFP BEV	3	$49,352	$44,875	$4,477	9.1%	$0.5
2024 TOYOTA PRIUS GAS	2023 FORD MUSTANG MACH-E RWD BEV	3	$40,128	$43,278	($3,150)	-7.9%	$1.0
2023 CHEVROLET SILVERADO 2WD GAS	2023 FORD F-150 LIGHTNING 4WD BEV	1	$65,862	$55,238	$10,624	16.1%	$0.5
2023 FORD F150 PICKUP 2WD GAS	2023 FORD F-150 LIGHTNING 4WD BEV	2	$60,756	$53,819	$6,937	11.4%	$0.5
2023 FORD TRANSIT CONNECT VAN FWD GAS		2	$43,687		$43,687	100.0%	$0.6
2024 CHEVROLET EQUINOX FWD GAS	2024 CHEVROLET EQUINOX 1LT BEV	2	$47,021	$37,028	$9,993	21.3%	$0.8
2023 FORD ESCAPE FWD GAS	2024 CHEVROLET EQUINOX 1LT BEV	7	$52,547	$39,537	$13,009	24.8%	$0.6

EV Charging Infrastructure

EV Charging Infrastructure

	Input Voltage (V)	Output Power (kW)	LDV Charge Rate	Primary Fleet Use
Level 1	120	1.4–1.9	2 to 5 miles of range per hour of charging	PHEVs and low mileage BEVs
Level 2	208 or 240	6.6–19.2	10 to 40 miles of range per hour of charging	BEVs that don't require a quick recharge
DC Fast	Typically 480	25–350	100 to 200+ miles of range in 30 minutes of charging	BEVs that need a quick recharge



Common Types of Connectors

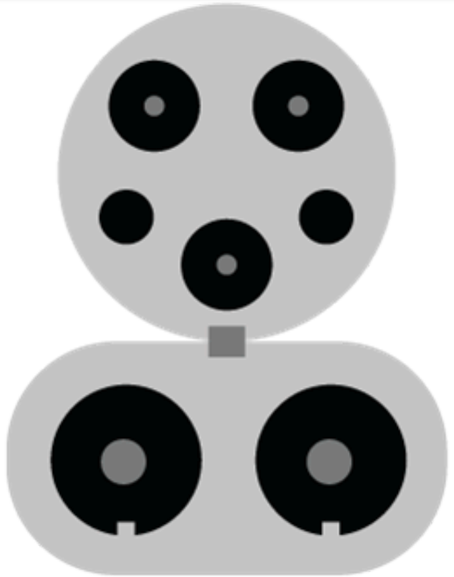
DC Fast Charging



J1772 connector



J3400 (NACS) connector



CCS connector



CHAdeMO connector

AC Level 1 and 2 Charging

Steps to Identify EVSE Needs

1 – Group ZEVs by where they park

2 – Determine the duration the ZEV needs to charge

3 – Identify what type of EV charging is needed

4 – Determine an EV:EVSE ratio for the project area

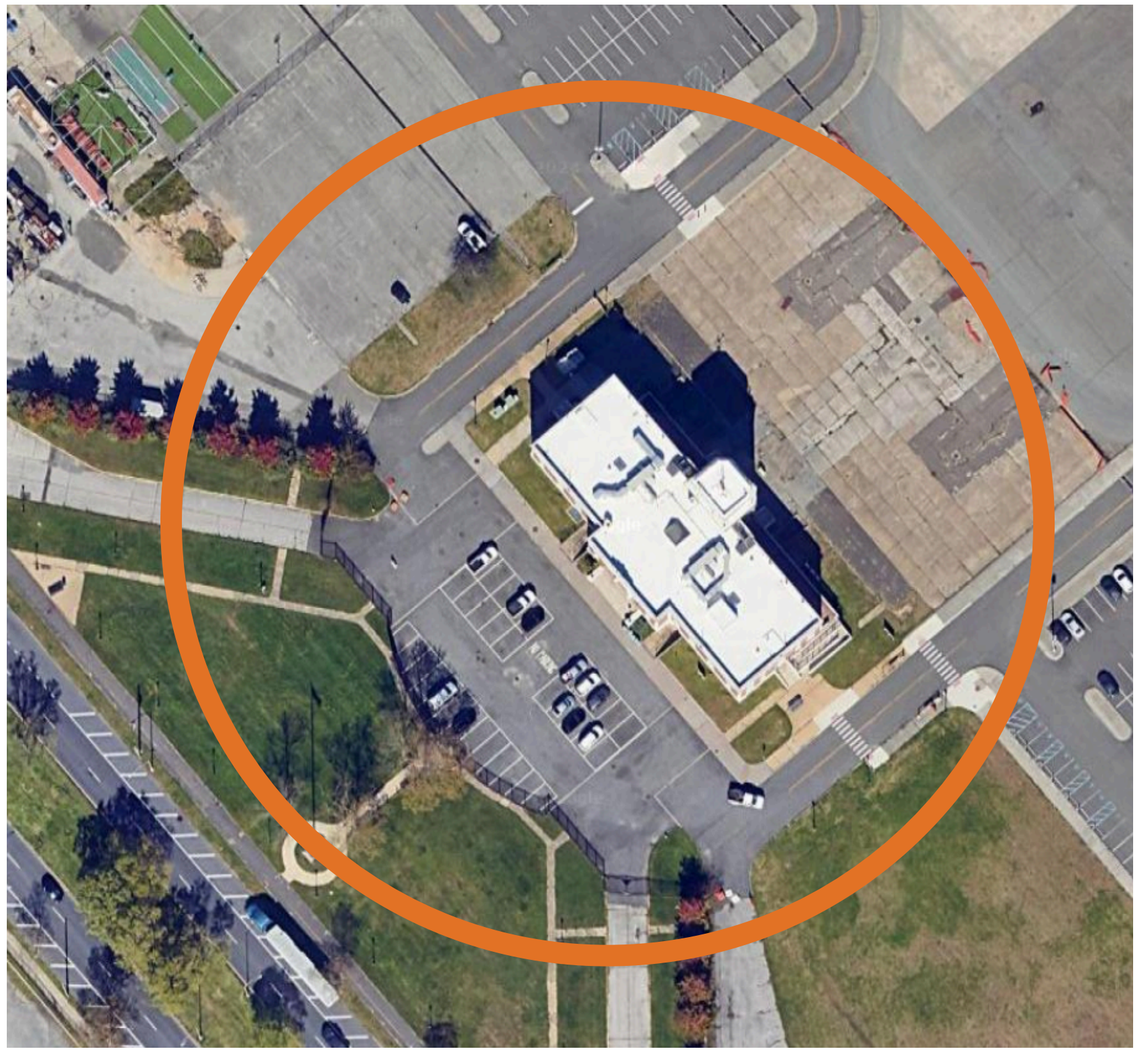
5 – Consider futureproofing opportunities

Example Scenario: Charging

- **Based on our operational and telematics data, we know that:**
  - All 20 vehicles return to the site at the end of their day (i.e., no vehicles are taken-home by staff or otherwise park offsite)
  - While the admin and motor pool vehicles spend an average of 20.5 hours per day on site, our inspection vehicles only spend around 11 hours on site each day as they are double shifted
  - The admin and motor pool vehicles are only used Monday through Friday and on average 194 days per year, but the inspection vehicles are used Monday through Saturday and on average 276 days per year

1 – Group Vehicles By Where They Park

- Create EV charging station “projects” for the parking areas where ZEVs will or could park.
- Use telematics or your fleet management information system to group vehicles.



2 – Determine the Duration the ZEV Needs to Charge

For each EV in the project area, look at the following information:



Battery size/range for ZEV replacement (BEV vs. PHEV)



How many miles the vehicle travels and how it compares to the ZEV replacement range



Vehicle dwell periods.



Available parking and flexibility to move ZEV after charging is complete

- **Vehicles will need to charge every 2 to 4 days (overnight)**
- **Midday charging would rarely be needed**

3 – Identify What Type of EV Charging Is Needed

When calculating the EV charging power level needed to support fleet vehicles, consider:

Rarely will a vehicle need to charge from 0-100%.

For vehicle relying on overnight charging, Level 1 or 2 charging is often sufficient

For vehicles that need on-site midday charging, DC fast charging may be needed

$$Power\ (kW) = \frac{Energy\ (kWh)}{Dwell\ Time\ (hours)}$$

Standard Level 2 (~6.7kW) EV charging stations will be sufficient (could consider managed charging to save costs)

4 – Determine an EV:EVSE Ratio

How many EVSE ports are needed to support fleet of 20 vehicles once they are 100% EVs?



2:1 EV:EVSE ratio to provide flexibility
10 EV charging station ports for 20 BEVs

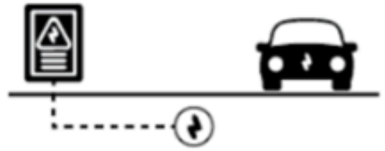
5 – Consider Futureproofing Opportunities

Considerations:

- Timeline for replacing the ZEV (what is needed in the next two-years vs. further out in the future)
- Add extra capacity in a service panel/ transformer upgrade or extra conduit to reduce future site work

EV-Capable Parking Space: Electrical Panel Capacity & Conduit

- Install panel capacity and conduit (raceway) to accommodate the future build-out of EV charging with 208/240 V, 40-amp circuits.
- Rational: Provide hard-to-retrofit elements during new construction while minimizing up-front cost.



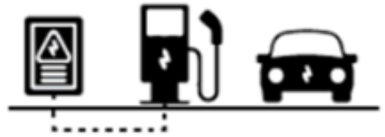
EV-Ready Parking Space: Install full circuit

- Full circuit installations include 208/240V, 40-amp panel capacity, raceway, wiring, receptable, and overprotection devices similar to a dryer circuit.
- Rational: Full circuits are plug-and-play ready and minimize total costs and additional barriers to installing Electric Vehicle Supply Equipment (EVSE).



EV-Installed: Install EV Charging Station (also known as Electric Vehicle Supply Equipment or EVSE).

- Install charging stations during new construction.
- Rational: Provide a visible signal that building supports EV charging and reduce future EV charger installation costs to zero.



Source: https://afdc.energy.gov/fuels/electricity-codes-and-ordinances

Phase 1: Install 6 Ports

Phase 2: Install 4 Ports

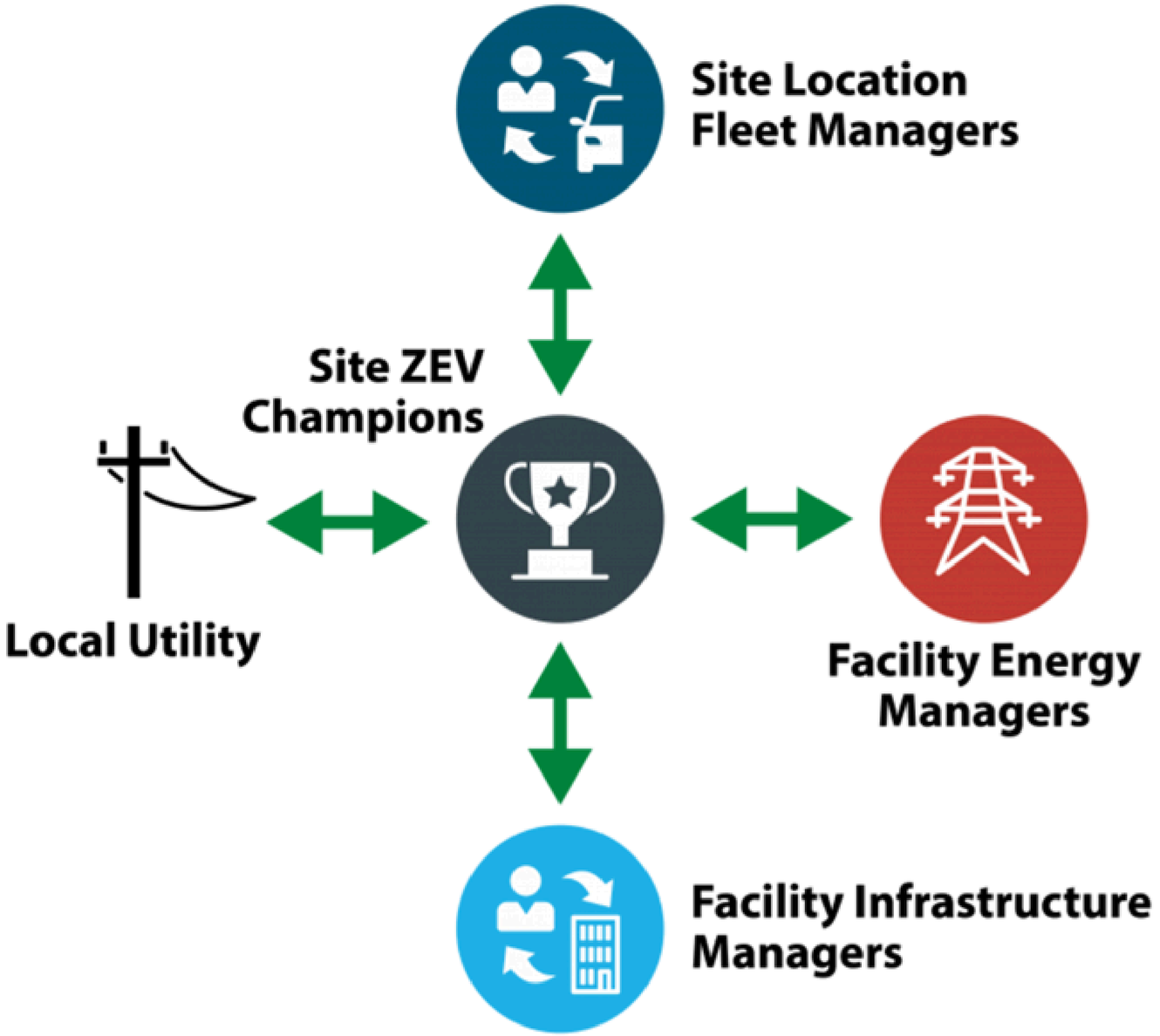
Site Assessment

Example Scenario: Site Assessment

- Site assumptions
  - The agency's headquarters building is older and needs electrical upgrades
  - The building does have a large capacity 3-phase service
  - The fleet vehicles park in a fleet only parking area

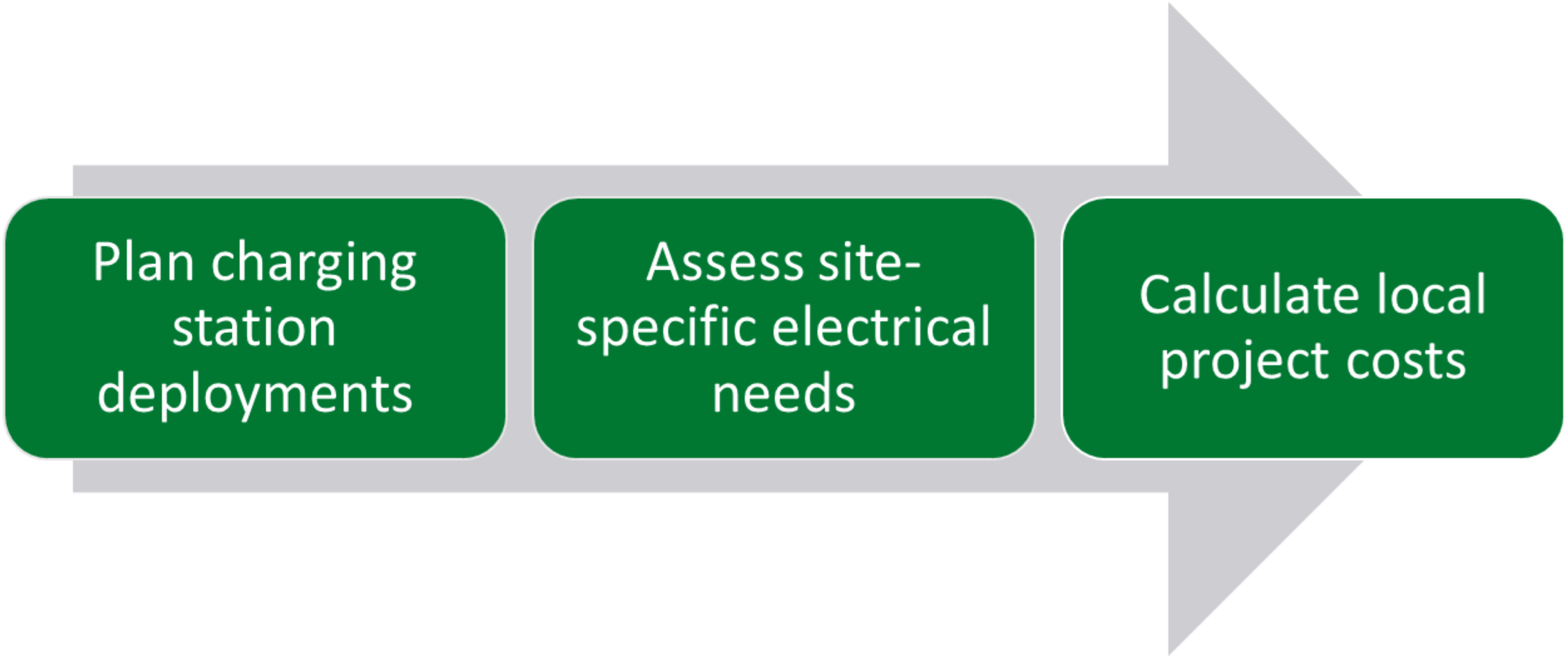
Site Assessment

EVSE design has wide impacts across the fleet location, including both fleet and facility operations. Critical to success is effective coordination between the site ZEV champion, site fleet manager, and facility infrastructure manager as well as your local utility.

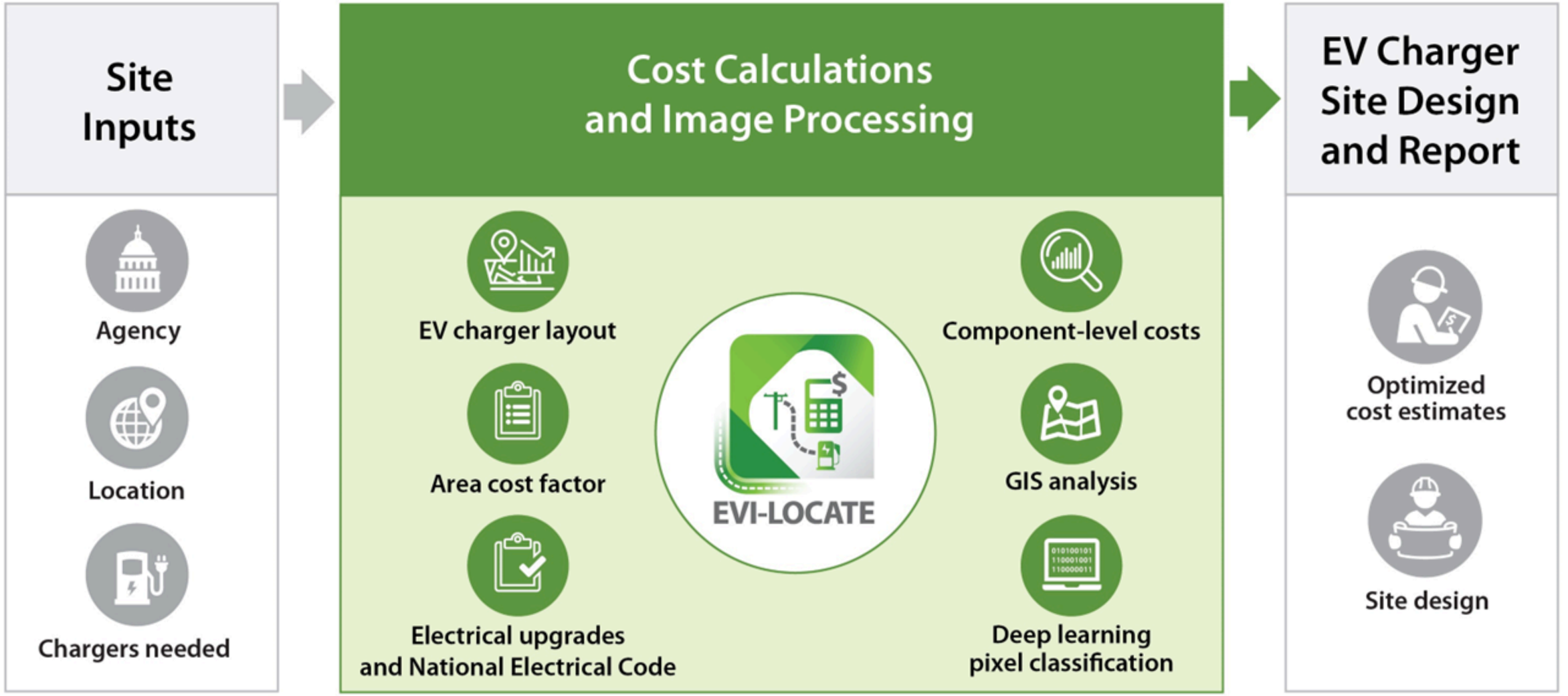


Electric Vehicle Infrastructure – Locally Optimized Charging Assessment Tool and Estimator

EVI-LOCATE



EVI-LOCATE: EV Charging Stations Site Assessment Tool



Define Site Boundary

Define Site

- Draw a polygon project area
- Name your site
- Make sure the polygon is large enough to include the charging stations, transformer, and panel

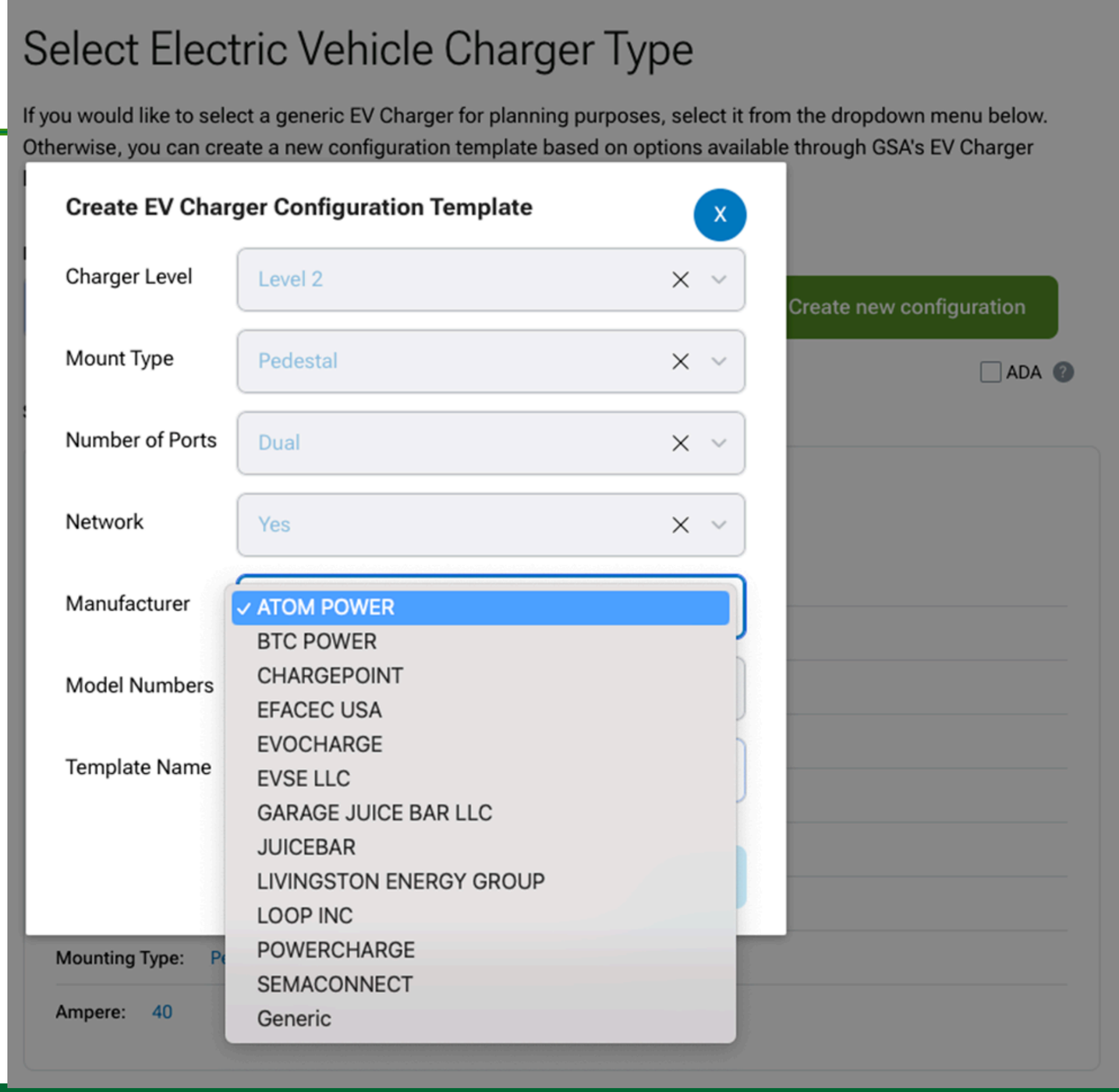


Select EVSEs

Select Template and Add to the Map

- Users can filter to their preferred charger or select generic option.
- Add to the map.

Generic Level 2 Dual Port Pedestal

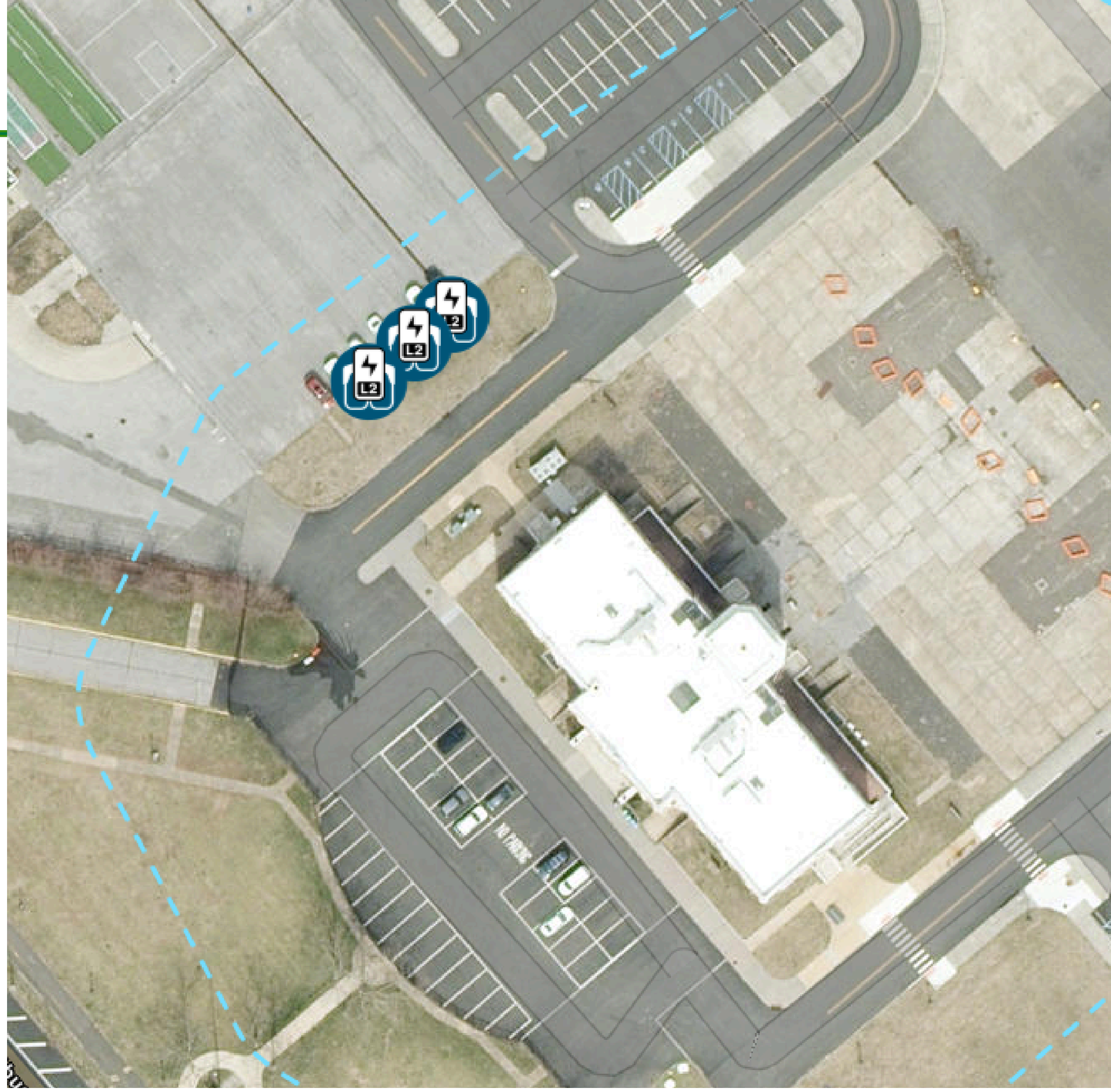


Select EVSEs

Select Template and Add to the Map

- Users can filter to their preferred charger or select generic option.
- Add to the map.

Add three dual port EV charging stations

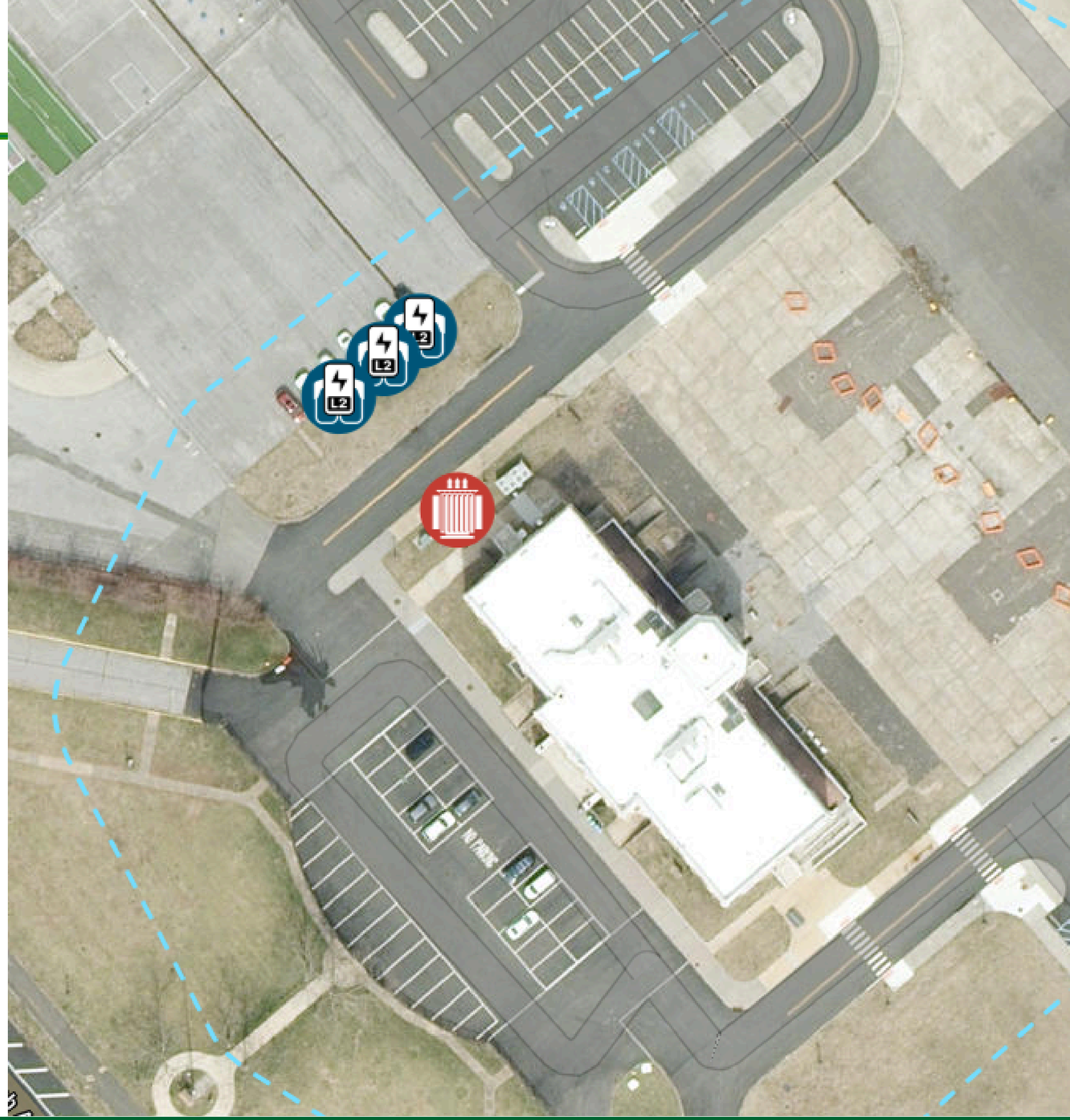


Transformer

Manage Transformer

- Select if costs should be included and if to add a new or use the existing transformer.
- Input existing rating (kVA) and peak load (kVA) to check if existing equipment is sufficient.

New transformer needed to support the project

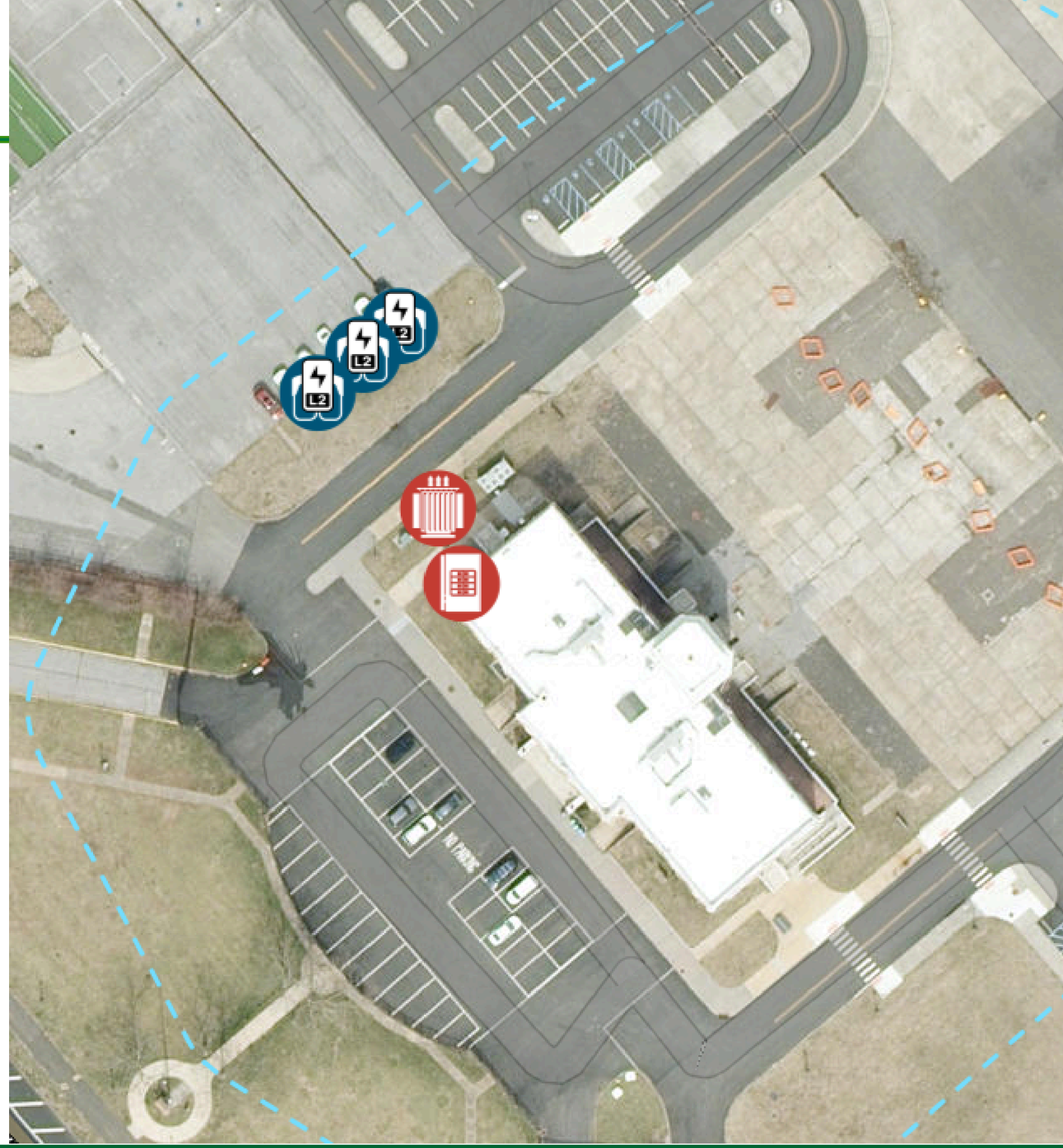


Service Panel

Manage Service Panel

- Select if costs should be included and if to add a new or use the existing service panel.
- Input existing voltage rating and (if using an existing panel) number of open spaces to check if existing equipment is sufficient.

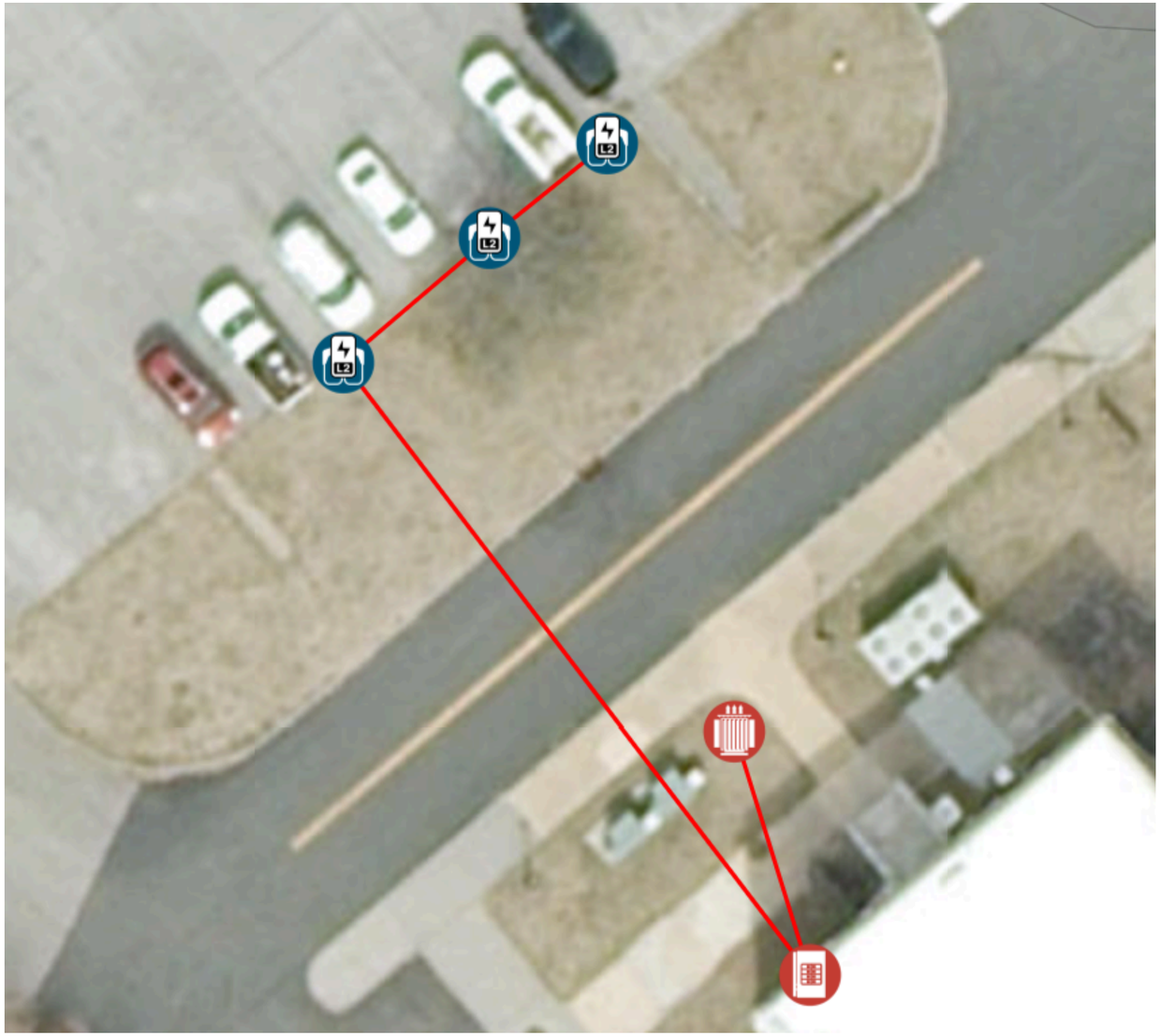
New service panel needed to support the project



Wiring: Connecting the Equipment

Wiring Run

- Tool identifies low-cost line from transformer to panel to chargers.
- Identifies hardscape and softscape.



Generate electric lines connecting the electrical equipment with the EVSE

Cost Calculations

Edit Cost Assumptions

Inputs for **Example Site**

EV GROUP 1 ADDITIONAL CONSTRUCTION COST COMPONENTS

Bollards:	Include
Wheelstops:	Include
Signage:	Include
Painting:	Include

PROJECT COSTS (%)

EVI-LOCATE includes default numbers for project costs that can be modified by the user. Please update any of these defaults as appropriate for your project.

State and Local Sales Tax Percent
0%

Contractor Overhead Percent
15%

Contractor Profit Percent
10%

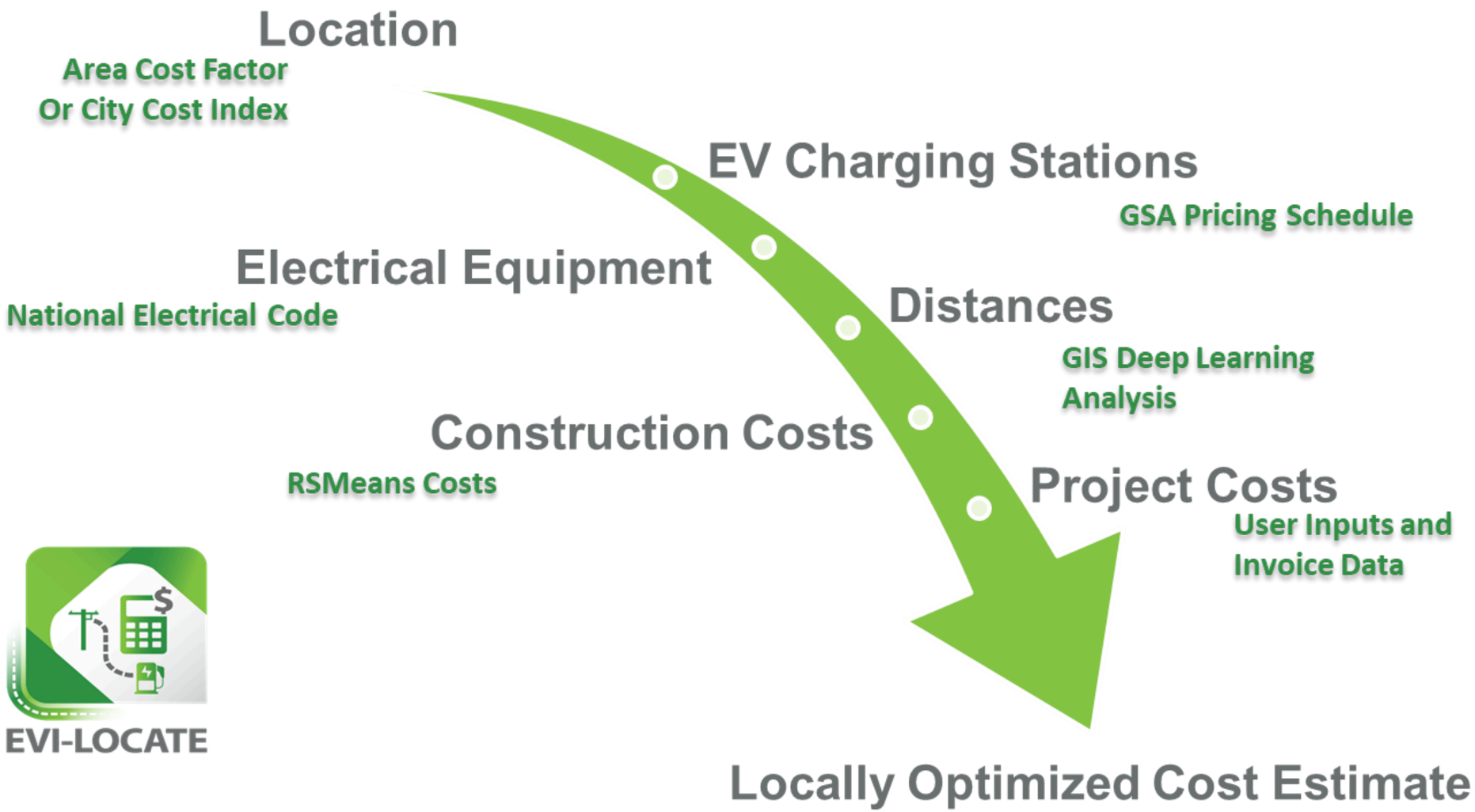
Bond Costs Percent
2.5%

Permits and Zoning Percent
2%

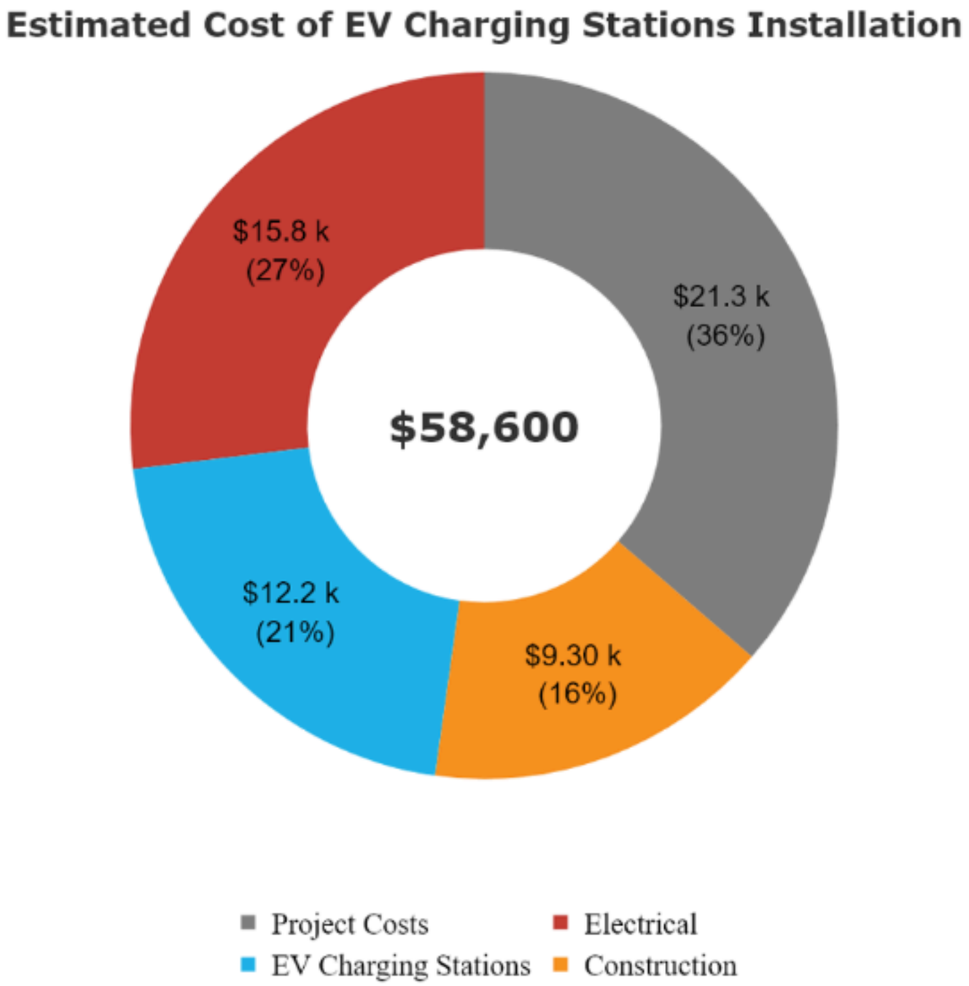
Contingency Cost Percent
20%

Generate Calculated Costs

Cost Estimator Components and Data Sources



Detailed Cost Estimates



- Accelerate the site design process
- Unify assumptions for cost calculations
- Generate detailed estimates in 20 minutes
- Organize agency EV charging planning

Questions?

Power Level (kW) = Volts X Amps / 1000

NEC 80% Rule – margin of safety to ensure circuits operate within a safe range

Panel Breakers	EVSE Power Rating	208V	240V
40 Amps	32 Amps	6.7 kW	7.7 kW
50 Amps	40 Amps	8.3 kW	9.6 kW
60 Amps	48 Amps	10.0 kW	11.5 kW
80 Amps	64 Amps	13.3 kW	15.4 kW
100 Amps	80 Amps	16.6 kW	19.2 kW

Load Management

NEC § 625.42 describes how to rate the load of EV charging. It states that "Electric vehicle charging loads shall be considered to be continuous loads"

NEC § 625.42 states: *"Where an **automatic load management system** is used, the maximum equipment load on a service and feeder shall be the maximum load permitted by the automatic load management system."*

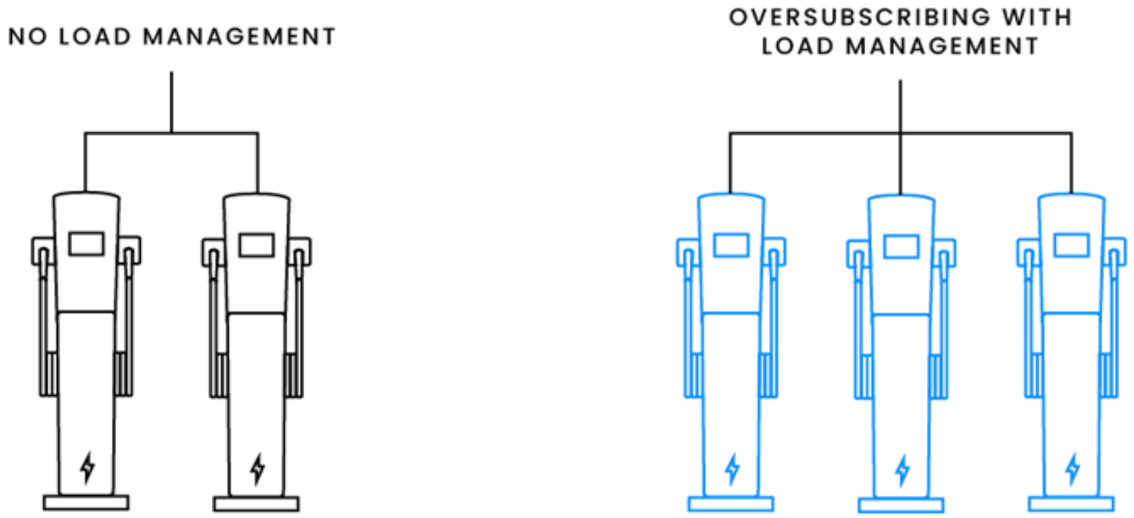
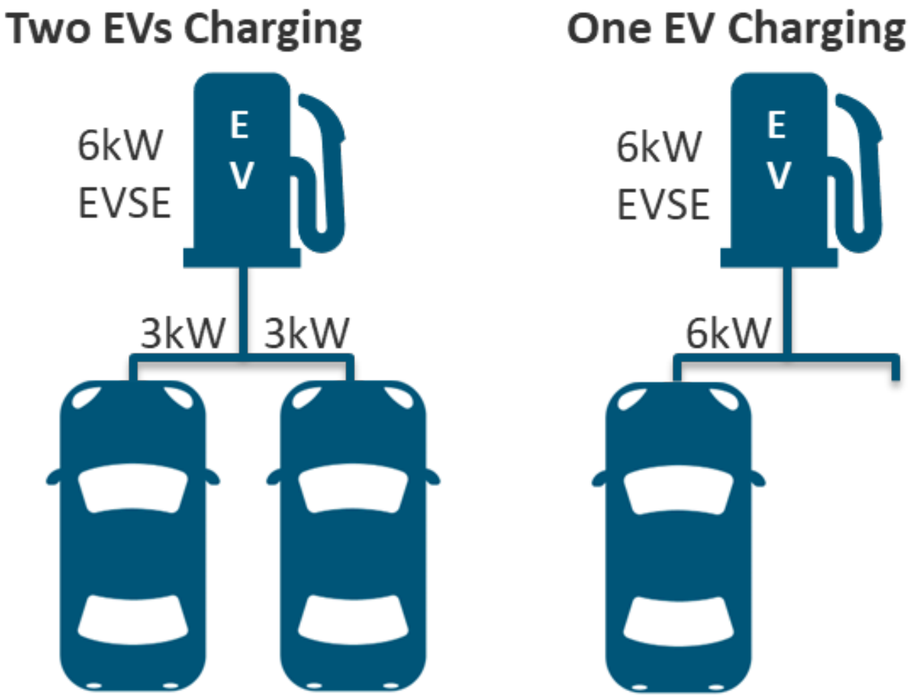


Image Source: https://www.ampcontrol.io/post/clearing-up-confusion-over-electric-vehicles-smart-charging-and-the-nec-80-rule



Considerations for Selecting Level 2 Power Rating

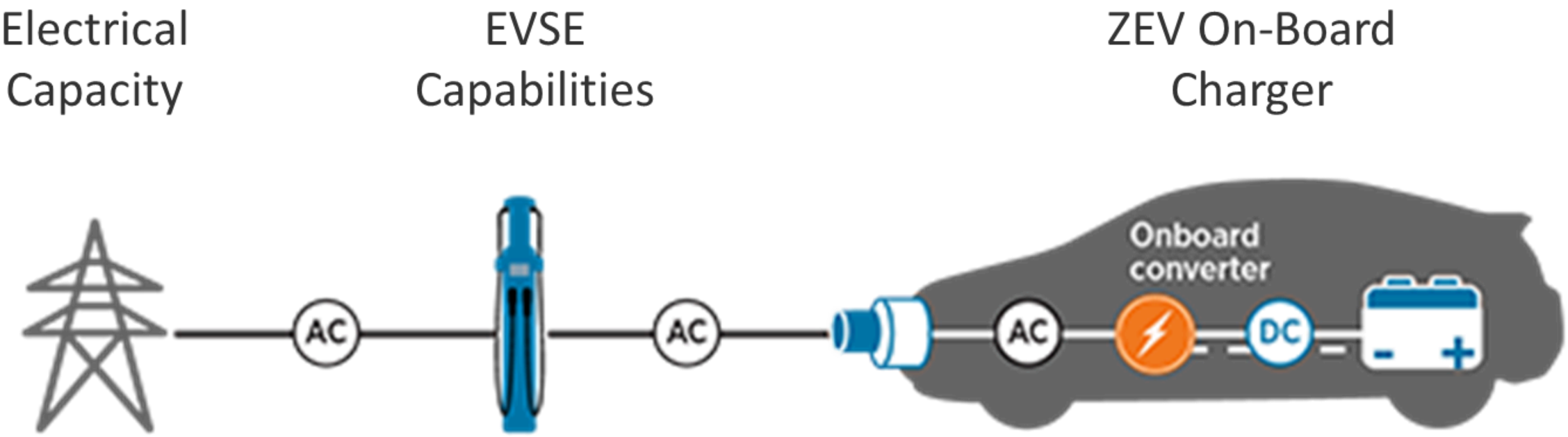


Image Source: https://www.chargepoint.com/blog/whats-difference-between-level-2-ac-charging-and-dc-fast-charging

PATH TO ZERØ

FLEET ELECTRIFICATION WORKSHOP



Amanda Nesheiwat
Director of Sustainability and Community Outreach
Hudson County improvement Authority



Christine Symington
Executive Director
Sustainable Princeton



Sangeeta Doshi
Camden Air Quality Committee
Cherry Hill Council Member

ENCORE ENERGY GROUP

Presentation by:

Jason Gumbaz -Director of EMobility & Infrastructure

JGumbaz@EncoreEnergyGroup.com

Anthony Barlotta -General Manager

Anthony@EncoreEnergyGroup.com

About Us -Encore Energy Group

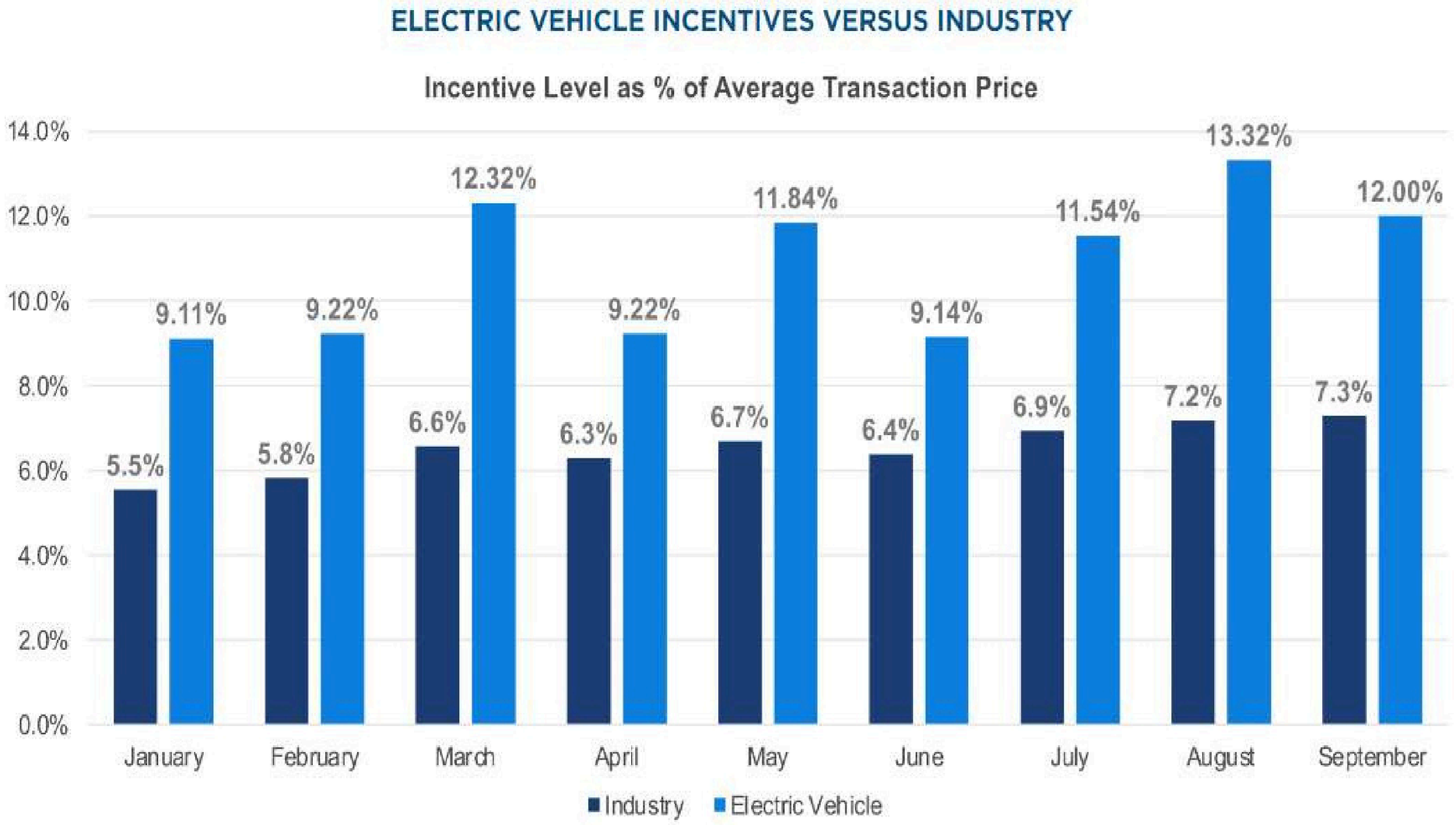
- Commercial & Industrial LED Lighting
- 13-Year Trade Ally for all local utility authorities
- Construction Management -EV Canopies



EV Charging & Infrastructure Solutions

- NJDOT -Work Type 44 -Electric Vehicle Charging Station Provider
  - Installation, operation and maintenance of DCFC & L2 in accordance with NJ NEVI
  - EVITP Certified Installers
- Electric Vehicle Charging Infrastructure Development
  - Engineering, feasibility, procurement, installation & incentive management
- Electric Vehicle Maintenance Service Provider
  - Tritium, BTC, ABB, Zerova, AK Signet, Eaton, ChargePoint, Blink, Siemens, Volta, Enphase
- Licensed Electrical Contracting & Tenant Fit-Outs -NASCLA

Q3 -2024

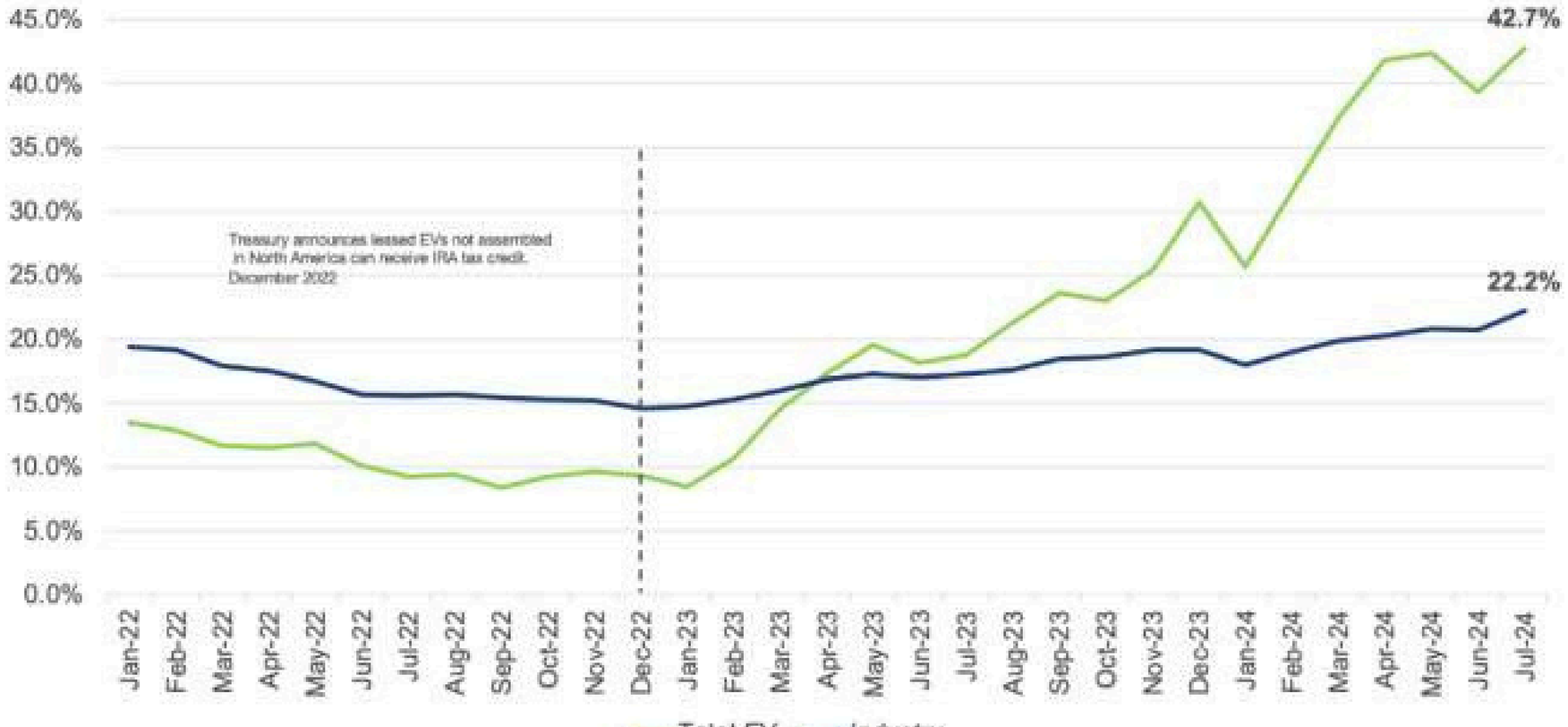


Electric vehicle incentives and discounts were elevated in Q3, which helped fuel higher sales. In Q3, incentives averaged more than 12% of the average transaction price (ATP), much higher than the industry-wide average of approximately 7%.

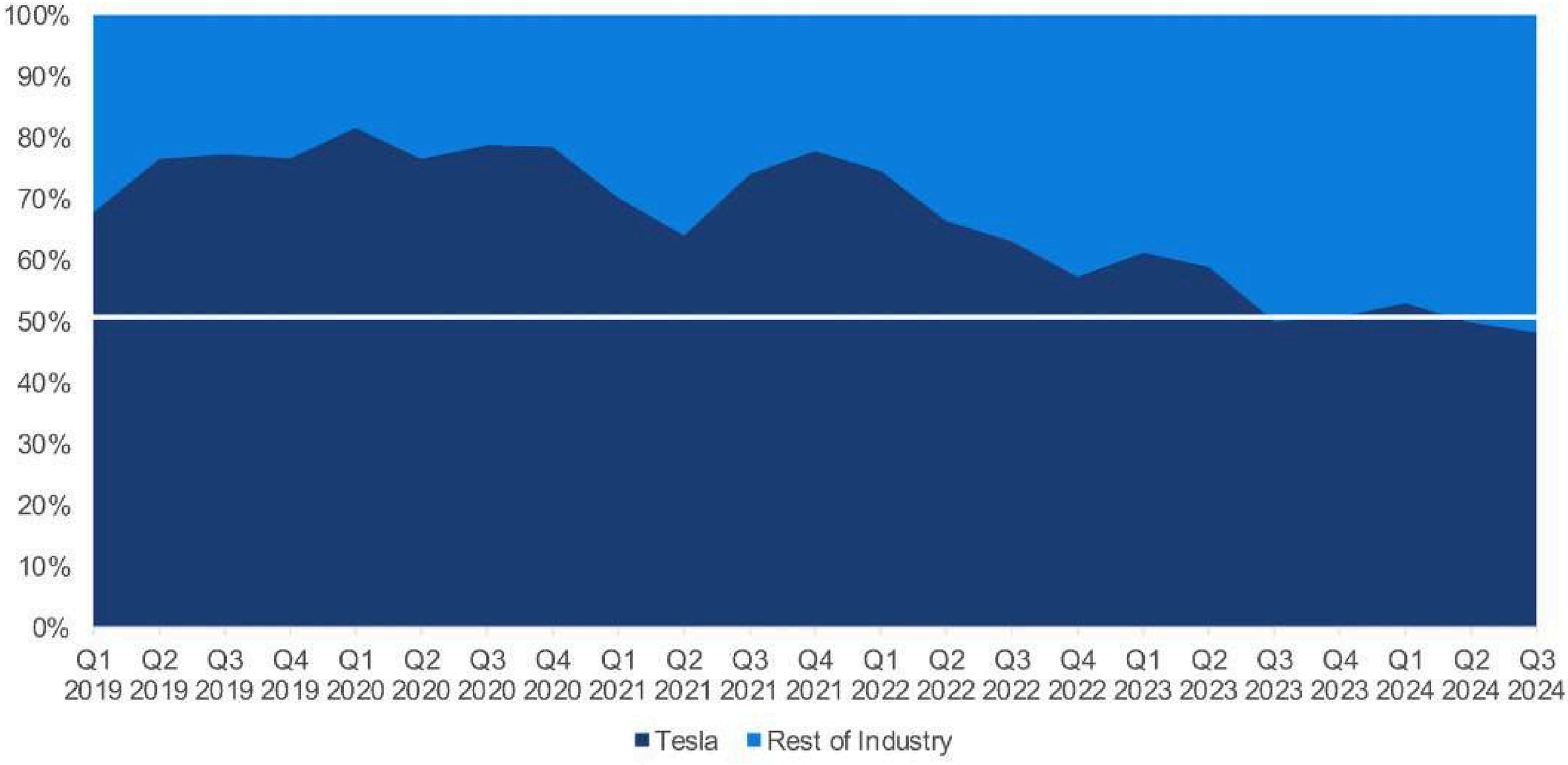
EV LEASE PENETRATION OF RETAIL SALES VERSUS INDUSTRY

The “leasing loophole” was also generously applied, as leasing allows all EV buyers to qualify for generous government-supported incentives.

Electric vehicle prices were higher year over year in Q3 but by less than 1%. The average price paid for an EV in Q3 was just over $57,000, a premium of approximately 19% compared to the industry-wide ATP of just over $48,000.



TESLA SHARE OF TOTAL EV SALES REMAINS BELOW 50%



E-Mobility Made Easy

- Customized Solutions
- Optimize Existing EV
- Site Features
- Hardware that Succeeds
- Management Software
  that works for you
  Contractors with Experience



Northern Highlands Regional High School

Allendale, NJ
(2) 120kW DCFC
Total Incentives: $223,883.29

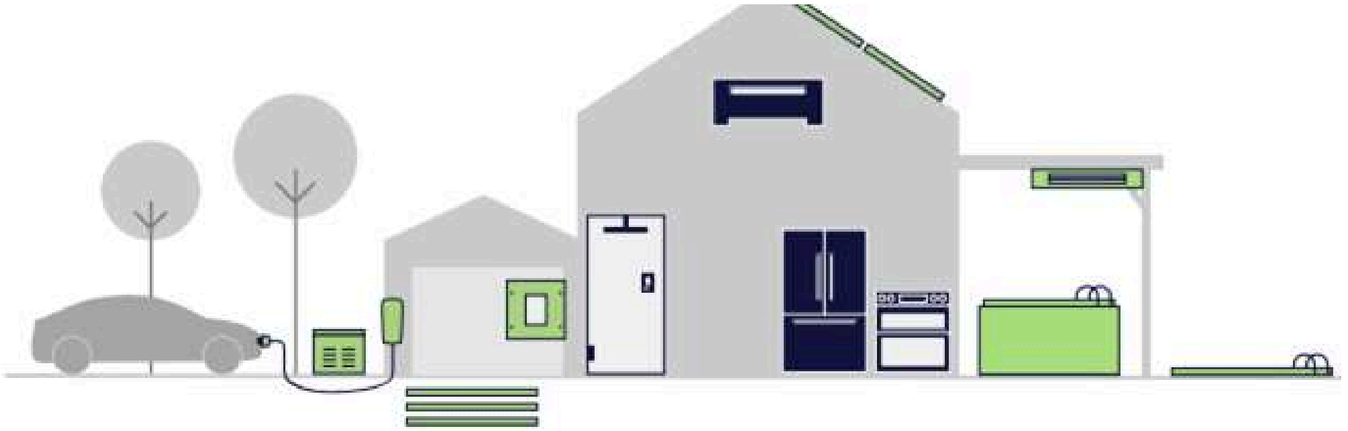


NJ Rebate & Grant Funding Opportunities - EV Chargers

- Utility Make-Ready Incentives
- NJ Clean Fleet
- NJ DEP -It Pay$ to Plug In
- NJ NEVI Planning
- NJBPU MUD EV Charging Station Grants
- NJDEP MHD Vehicle Electrification Grants
- NJBPU EV Fleet Grant Program

INTRODUCING SPAN





WHY SPAN?

SPAN Enables the smart, electrified home of the future

Control your home's energy usage
Manage and monitor all of your home's circuits in real time with the SPAN Home app.

Charge your EV faster with SPAN Drive
Get max-available charging speeds 24/7 without an expensive electrical service upgrade.

Get the ultimate whole-home backup
SPAN pairs with battery storage to intelligently extend the legnth of your home backup during an outage.

Prepare for future home upgrades
Dynamic load management enables electrification upgrades like solar and battery systems, heat pumps, and EV chargers.

INDOOR LOAD EXAMPLES

- HVAC/AC/Heat pump
- Sauna
- Steam shower*
- Induction cooktop/Dual compressor refrigerator/ Double ovens*

OUTDOOR LOAD EXAMPLES

- Electrical patio heater
- Snow melting systems
- Generator
- Pool
- Hot tub
- Solar panel

Questions?





PATH TO ZERØ

FLEET ELECTRIFICATION WORKSHOP



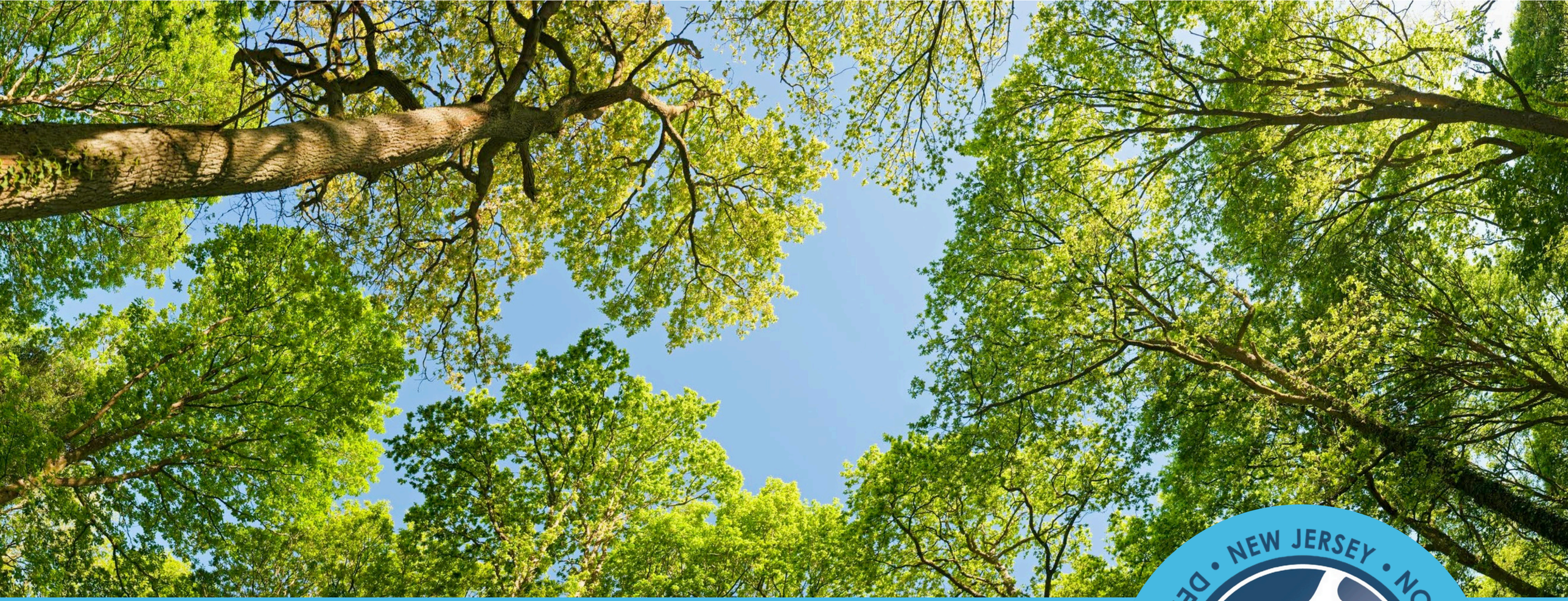
Melissa Evanego
Assistant Director
New Jersey Department of Environmental Protection



Cathleen Lewis
Clean Transportation Programs Manager
New Jersey Board of Public Utilities



Julia Kotz
Environmental Engineer
Environmental Protection Agency, Region 2



NJCCC Path to Zero: Fleet Electrification Workshop

NJ Electrification Funding Programs



Teamwork and Collaboration

Federal Agencies

State Agencies

Regional Organizations

Non-Profit Organizations

Private and Public Entities



- **Infrastructure –** NJ and beyond
- Resources – Technical and Informational
- **Financial Incentives –** Grants and tax credits

Electrification Incentives

NJDEP

- It Pay$ to Plug In (IPPI)
- Diesel Modernization Program (DMP) – Class 2b-8 electric vehicles and charging stations
- Electric School Bus (ESB) Grant Program
- eMobility Programs
- NJ Fleet Advisory Program

NJEDA

- NJZIP – Class 2b-8 electric vehicles

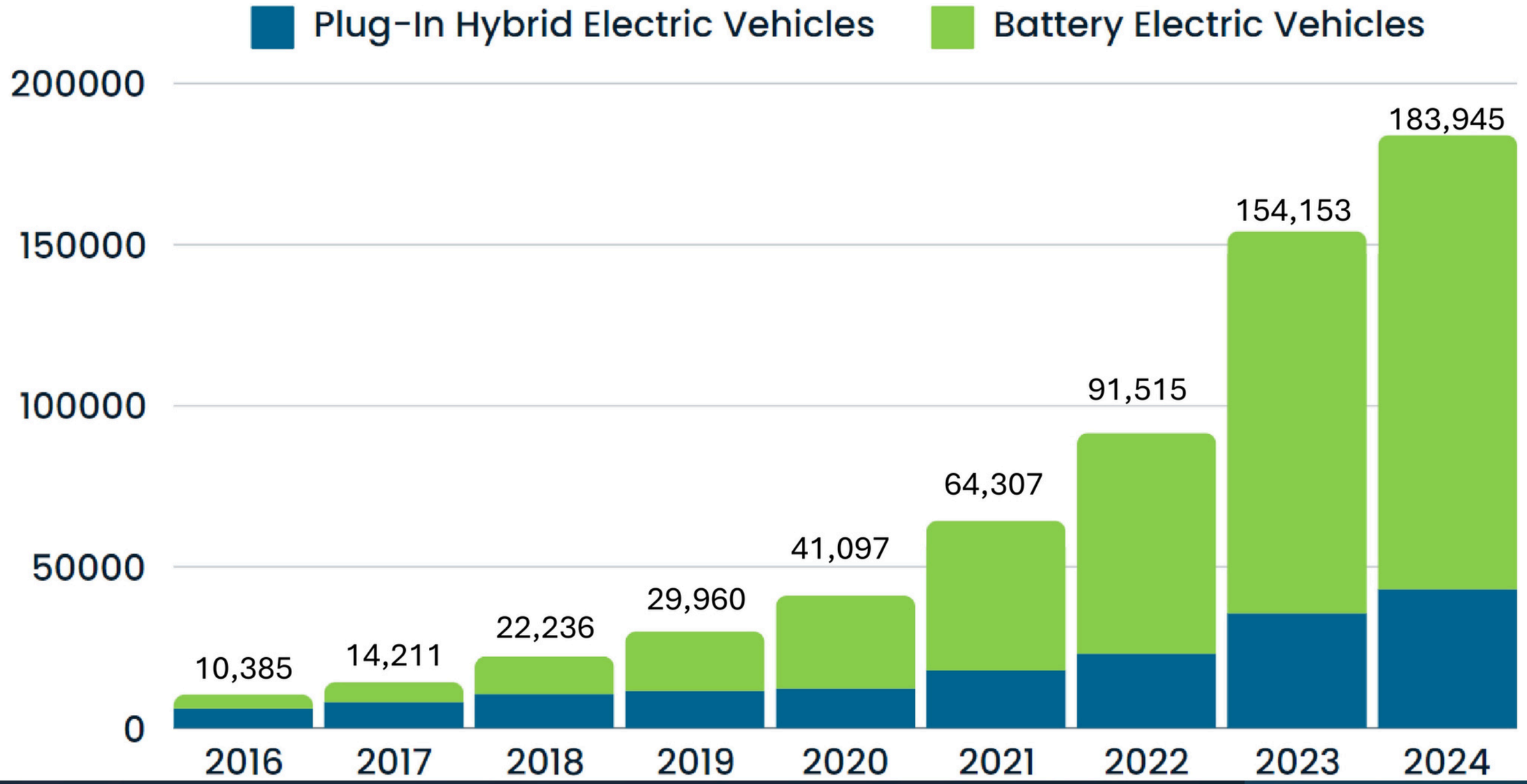
BPU

- Charge Up NJ (cash on the hood)
- RGGI Medium & Heavy-Duty Electric Vehicle Charging Program
- MUD EV charging Program
- EV Clean Fleet program
- Utility EV charging and make ready programs

Federal

- EPA Grant programs
- Commercial Clean Vehicle

New Jersey Electric Vehicle Registration data through 6/2024



NJ's Electric Vehicle PUBLIC Charging Stations

Public EV Charging Stations - USDOE AFDC	It Pay$ to Plug In Grant Program
Level 1 – 2 charging stations	Level 1 – 5 charging stations
Level 2- 1,162 charging stations	Level 2- 1,096 charging stations
DCFC – 291 charging stations	DCFC – 61 charging stations

NJ DEP's It Pay$ to Plug In Grant Reimbursement

- $750 per port for Level 1 charging stations
- Up to $4,000 per single port/$8,000 per dual-port, networked L2 charger
- Maximum of 20 ports per location (either 10 dual-port, or 20 single-port)
- Applicants may not be approved for more than $500,000.00 in projects in a calendar year
- Eligible costs: Purchase of charging station(s) **and** associated delivery and activation fees, warranty, network subscription, maintenance contract, and leasing agreement (if applicable)



NJ DEP

FEDERAL FUNDING AWARDS

PUBLIC ELECTRIC VEHICLE CHARGING

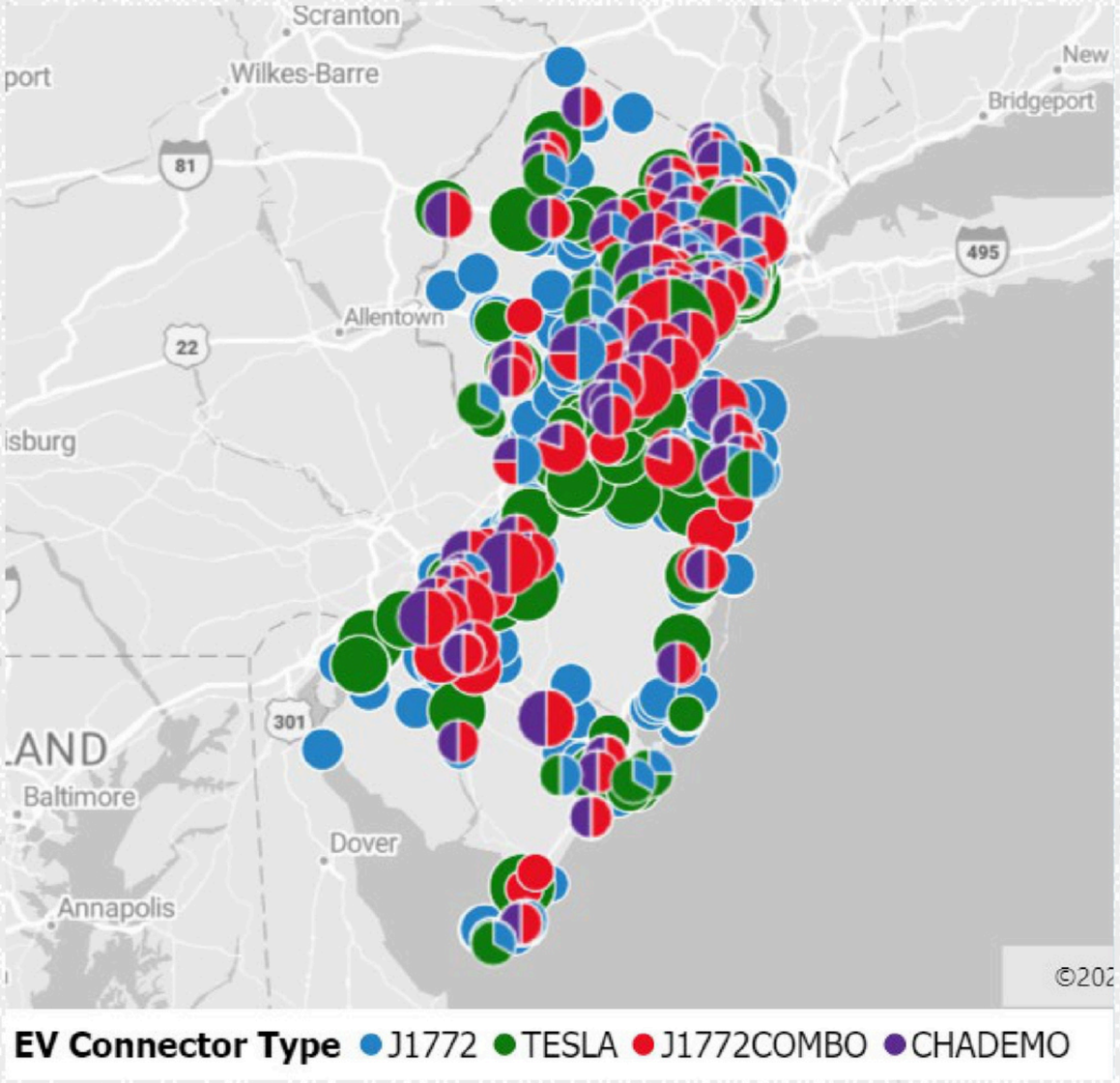
Infrastructure Investment & Jobs Act aka Bipartisan Infrastructure Law (BIL)

National Electric Vehicle Infrastructure (NEVI) Formula Program

Electric Vehicle Charger Reliability and Accessibility Accelerator

Federal funding to provide grants to eligible entities to improve reliability of existing electric vehicle (EV) infrastructure by repairing and replacing existing chargers that are broken or non-operational.

- NJ applied and awarded ~$6 million
  - 77 sites with 247 ports
  - 219 L2s and 28 DCFCs
  - ChargePoint, Blink and Electrify America EVSE



U.S. Department of Transportation
Federal Highway Administration

Biden-Harris Administration Announces $623 Million in Grants to Continue Building Out Electric Vehicle Charging Network

Thursday, January 11, 2024

Funding will deploy chargers in communities and along major travel corridors, while promoting American jobs and leadership in EV charging

FHWA 01-24
Contact: FHWA.PressOffice@dot.gov
Tel.: (202) 366-0660

WASHINGTON – The Biden-Harris Administration today announced $623 million in grants to help build out an electric vehicle (EV) charging network across the U.S., which will create American jobs and ensure more drivers can charge their electric vehicles where they live, work, and shop. This is a critical part of the Biden Administration's goal of building out a convenient, affordable, reliable and made-in-America national network of EV chargers, including at least 500,000 publicly available chargers by 2030 ensuring that EVs are made in America with American workers.

Project selections in this round of grants include:

- $10 million to the New Jersey Department of Environmental Protection to build EV charging stations for residents in multi-family housing in disadvantaged communities and rural areas. The project also will focus on areas near transit stations to encourage the use of shared transportation services such as electric carshare and rideshare options.
- $15 million to the Maryland Clean Energy Center to build 58 electric vehicle charging stations in urban, suburban and low- and moderate-income communities across the state. Proposed sites include Coppin State University, an HBCU (Historically Black Colleges and Universities) in Baltimore and 34 disadvantaged communities with multi-family housing. The project also includes workforce development programs that offer services to help train, place, and retain people in good-paying jobs or registered apprenticeships.
- $70 million to the North Central Texas Council of Governments to build up to five hydrogen fueling stations for medium- and heavy-duty freight trucks in Dallas-Fort Worth, Houston, Austin, and San Antonio. The project will help create a hydrogen corridor from southern California to Texas.
- $15 million to the County of Contra Costa in California to build a total of 52 fast chargers and 60 Level 2 chargers at 15 branch locations of the county's library system.
- $15 million to Energy Northwest, a joint operating agency in Washington State, to install 40 fast chargers and 12 Level 2 chargers across western Washington State and northern Oregon. The project will provide EV access to largely rural and disadvantaged communities, including on Indigenous Tribal lands.
- $12 million to the City of Mesa, Arizona, to build 48 electric vehicle chargers for a variety of vehicle sizes, charging docks for e-bikes and e-scooters, and solar canopies to support electricity generation at the stations.
- $1.4 million to the Chilkoot Indian Association, an Alaska Native Tribe, to build an EV charging



NJ DEP was awarded $10M !

CHARGING FUELING INFRASTRUCTURE COMPETITIVE SOLICITATION

To expand access to EV charging for NJ's multifamily households

Focusing on areas:

- Near MUDs and/or transit stations
- In communities with a high ratio of MUDs
- Disadvantaged communities

Cory Booker

Booker Announces $10M for NJ Electric Vehicle Charging Stations

JANUARY 11, 2024

NEWARK, N.J. — U.S. Senator Cory Booker (D-NJ) announced a $10 million award to the New Jersey Department of Environmental Protection to build electric-vehicle (EV) charging stations, expanding access to cleaner vehicles and boosting the state's climate-mitigation goals.

The grant will enable New Jersey to expand EV charging stations for residents of multi-family housing in low and moderate-income neighborhoods, underserved communities, and rural areas. It is part of the Charging and Fueling Infrastructure Discretionary Grant Program, created by the Bipartisan Infrastructure Law, which Booker voted to support.

"A healthier, more sustainable future depends on expanding access to EVs, including for low-income and rural residents," **said Senator Booker.** "Everyone deserves to benefit from the transition away from gasoline- and diesel-powered vehicles to cleaner forms of transportation that will not only improve air quality and therefore health outcomes in our neighborhoods but also help combat the climate crisis that disproportionally impacts lower-income communities. This grant is made possible by the Biden Administration's commitment to environmental justice for all communities."

Administered by the Federal Highway Administration, the grant will help New Jersey fill gaps in EV charging infrastructure and target areas near transit stations to encourage the use of shared transportation services such as electric carshare and rideshare options.

In May 2023, Booker introduced the EVs for All Act, bicameral legislation that would increase access to EVs for residents of public housing, including by increasing EV car sharing services in public housing.

The latest federal award comes months after New Jersey leaders announced $10 million in state funding to accelerate buildout of EV charging-station infrastructure.

PRINT EMAIL SHARE TWEET

Tags: Environment, Infrastructure

NJ's Clean Corridor Coalition Award

MHD ZEV Charging Infrastructure CPRG Grant

- $248,900,000 for public freight truck charging infrastructure at approximately 20-24 sites
- 459,000 tons of GHGs reduced from 2025-2030, >18 million tons from 2025-2050
- Four states comprise the coalition ("C3"):
  - NJ DEP
  - MDE, MDOT
  - DelDOT
  - CT DEEP

NJ's Medium and Heavy-Duty funding programs

Examples: street sweepers, transit buses, garbage trucks, delivery trucks, bucket trucks, and port equipment.

Over **$310 MILLION** has been awarded for over 1,000 electric vehicles/equipment and charging equipment.

Rolling application process









ELECTRIC SCHOOL BUS GRANT PROGRAM



Eligible Applicants

School districts that own their own buses

School bus contractors providing busing services to schools.

Eligible Buses

All electric

Type C or D

New

(No repowers or used buses)

Purchase or leased

(A minimum five-year lease is required)

Vehicle to Building Pilot Program



Electric School Bus Law

- $15M a year for 3 years
- Year 1 awards announced next week

~$76M has been awarded for 253 electric school buses

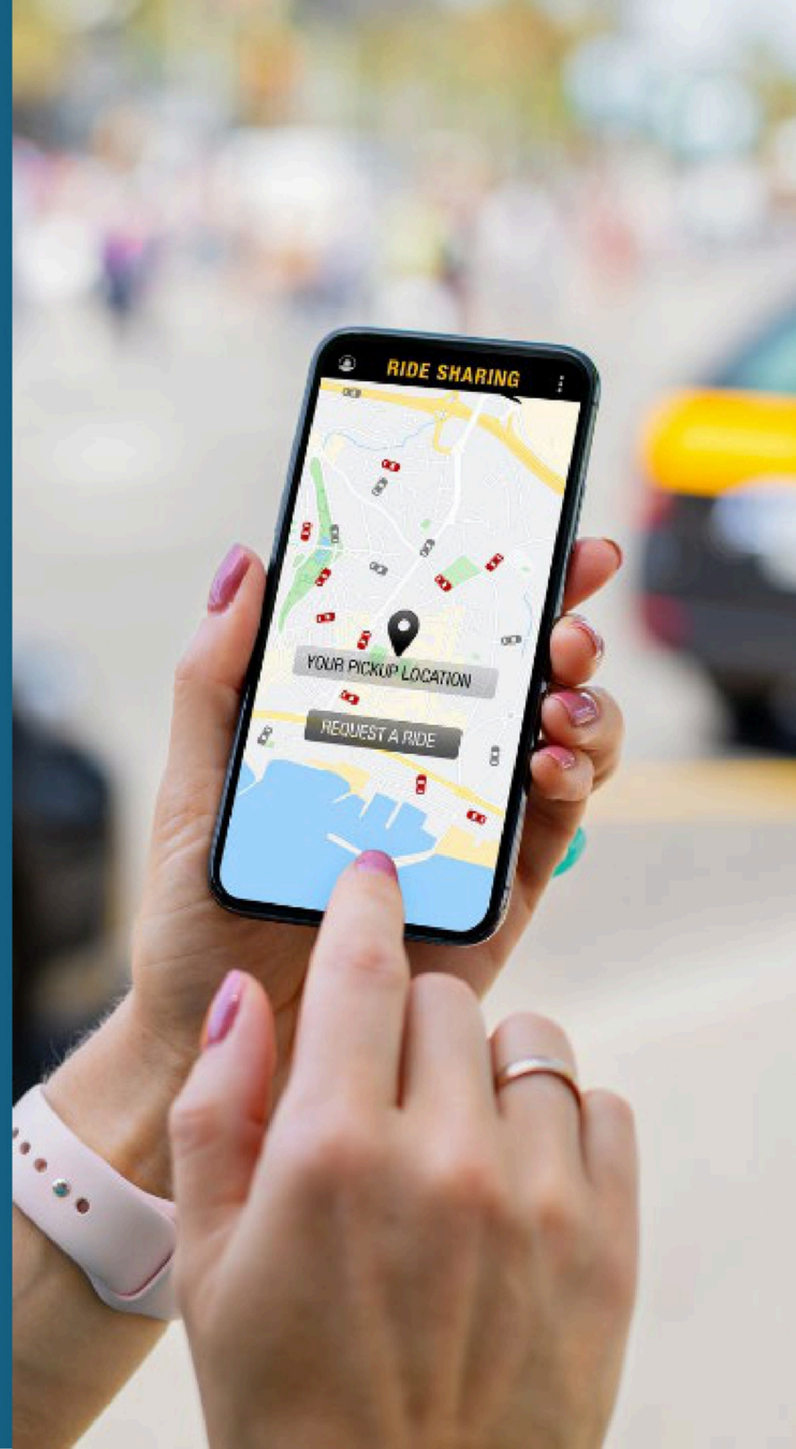


What is eMobility?

A multifaceted approach must be taken to reduce the emissions from the transportation sector. **eMobility** is one approach that provides clean transportation to citizens who may not own their own vehicles.

Shared Transportation using EVs:

- ✓Rideshare
- ✓Carshare
- ✓Ride hailing
- ✓Shuttle Services
- ✓And more



NEW JERSEY FLEET ADVISOR

FLEET ELECTRIFICATION ASSISTANCE

What does New Jersey Fleet Advisor do?

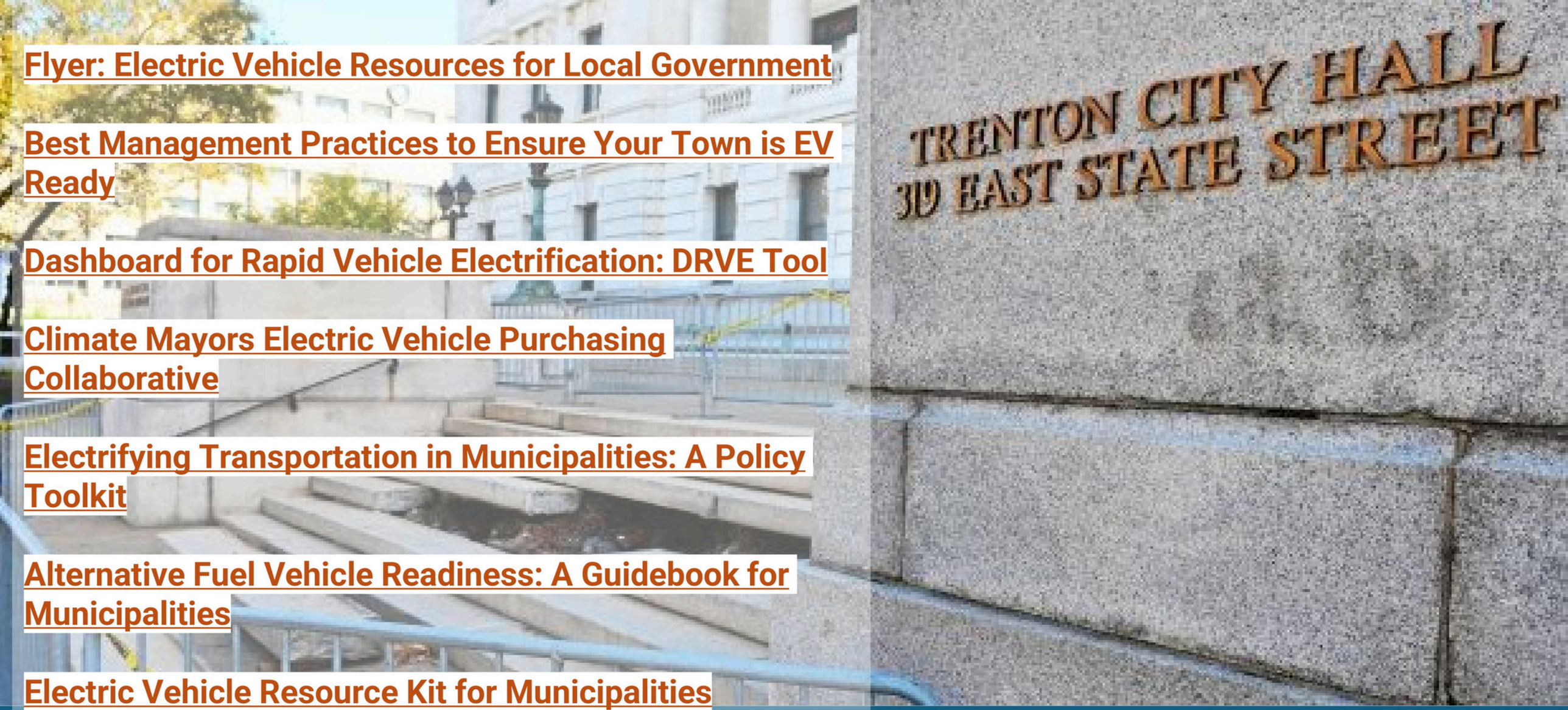
New Jersey Fleet Advisor will provide **FREE** technical assistance to 15 fleets interested in learning how to transition to zero-emission vehicles. Each fleet selected to participate will receive a personalized Fleet Electrification Roadmap document with:

- **Vehicle Recommendations**: One-to-one zero-emission vehicle replacements based on your current fleet vehicles' duty cycles
- **Cost Projections**: Total cost of ownership analysis for transitioning each vehicle to a zero-emission model
- **On-Site Electric Infrastructure Assessment**: Evaluation of electrical capacity for charging equipment and infrastructure upgrades needed
- **Financial Information**: Detailed descriptions and application instructions for available funding and incentive opportunities
- **Zero-Emission Basics**: Everything you need to know to transition to zero-emission vehicles in easy-to-understand language

ELECTRIC SCHOOL BUS RESOURCES

- Types of Electric School Buses
- 2024 ESB market report and buyer's guide
- All About Charging Infrastructure
- Step by Step Guide for ESB electrification
- Cold Weather Impacts on Electric School Buses
- Technical Assistance Menu
- WRI weekly office hours for 1:1 support
- Power Planner- coordinating with your utility
- NJ Utility Contact Sheet
- Explainer on how school districts can access IRA tax credits
- ESB batteries and battery safety





[Flyer: Electric Vehicle Resources for Local Government]

[Best Management Practices to Ensure Your Town is EV Ready]

[Dashboard for Rapid Vehicle Electrification: DRVE Tool]

[Climate Mayors Electric Vehicle Purchasing Collaborative]

[Electrifying Transportation in Municipalities: A Policy Toolkit]

[Alternative Fuel Vehicle Readiness: A Guidebook for Municipalities]

[Electric Vehicle Resource Kit for Municipalities]

Local Government | Resources



Important Links

1. MUD Toolkit
2. Model EV Ordinance
3. NJ's Medium & Heavy - Duty Vehicle Incentives
4. EDA NJZIP
5. NJDEP Diesel Modernization Program
6. Electric Vehicle and Charging Incentives
7. Alternative Fuel Vehicle Refueling Property Credit
8. Commercial Clean Vehicle Credit
9. Electric Vehicle Law P.L.2007, c.340 and P.L.1999, c.23
10. Right to Charge Law P.L. 2020, c. 108
11. Electric Vehicle Installation Requirement Law P.L. 2020

Follow NJDEP Bureau of Mobile Sources on social media!



Melissa Evanego
Assistant Director – Air Monitoring & Mobile Sources
melissa.evanego@dep.nj.gov

NJ DEP Instagram

NJ DEP Bureau of Mobile Sources Instagram (@DriveCleanNJ)

NJ DEP Facebook

NJ DEP Air, Energy & Materials Sustainability (AEMS) Facebook

NJ DEP Twitter @NewJerseyDEP

NJ DEP YouTube Channel

Visit NJ DEP Bureau of Mobile Sources webpages

- www.nj.gov/dep/drivegreen
- www.stopthesoot.org

Join our DEP mailing list for updates and funding announcements

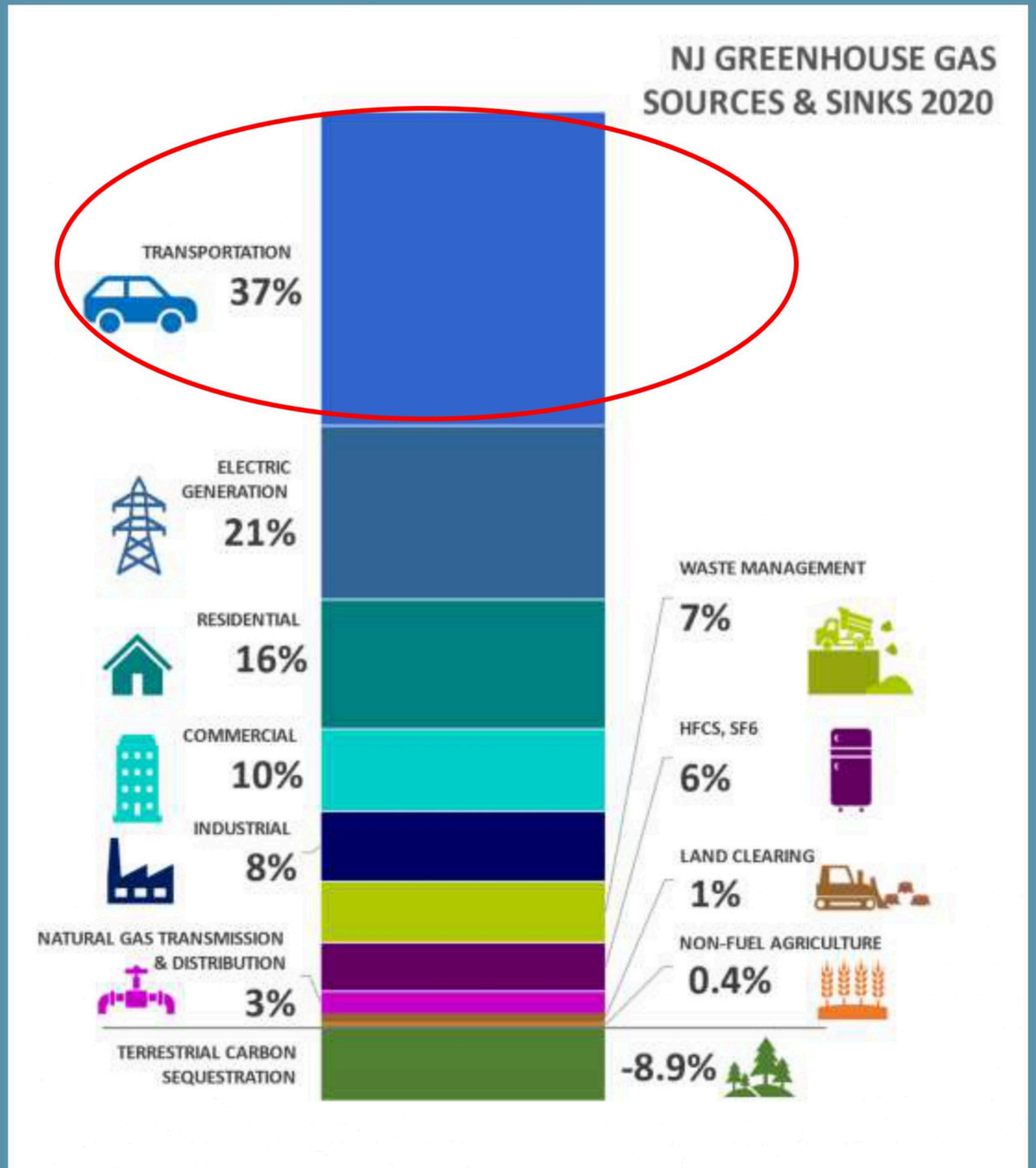
www.state.nj.us/dep/stopthesoot/sts-listserv.htm

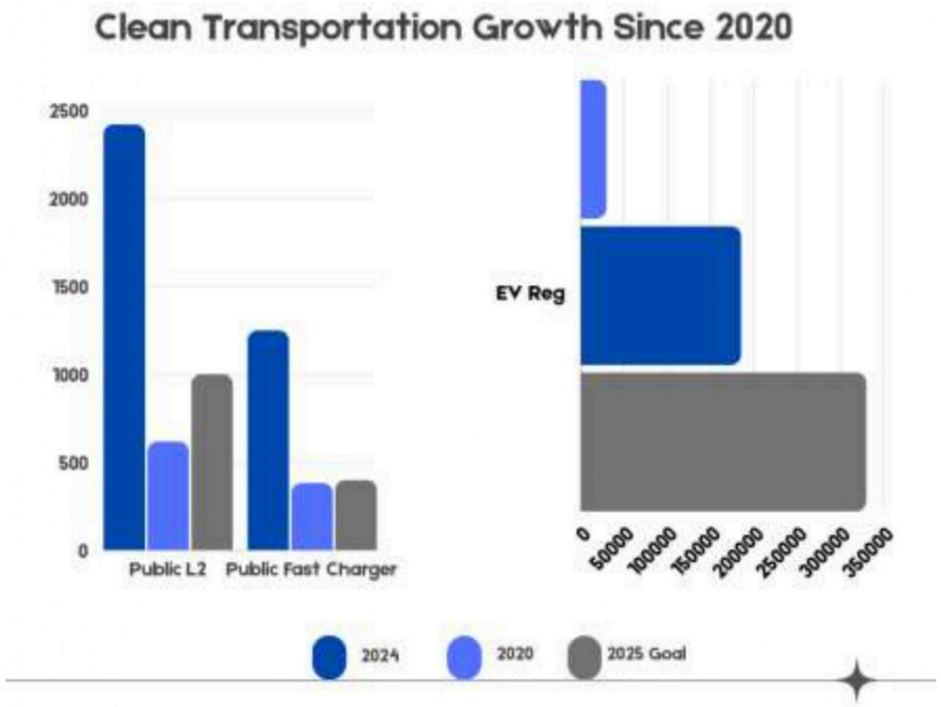
NJ BPU:

Driving EV Adoption

10/16/24

Clean Cities

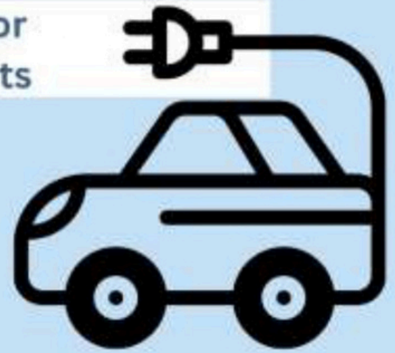

NJ GREENHOUSE GAS
SOURCES & SINKS 2020
TRANSPORTATION
37%
ELECTRIC
GENERATION
21%
RESIDENTIAL
16%
COMMERCIAL
10%
INDUSTRIAL
8%
NATURAL GAS TRANSMISSION
& DISTRIBUTION
3%
TERRESTRIAL CARBON
SEQUESTRATION
WASTE MANAGEMENT
7%
HFCS, SF6
6%
LAND CLEARING
1%
NON-FUEL AGRICULTURE
0.4%
-8.9%



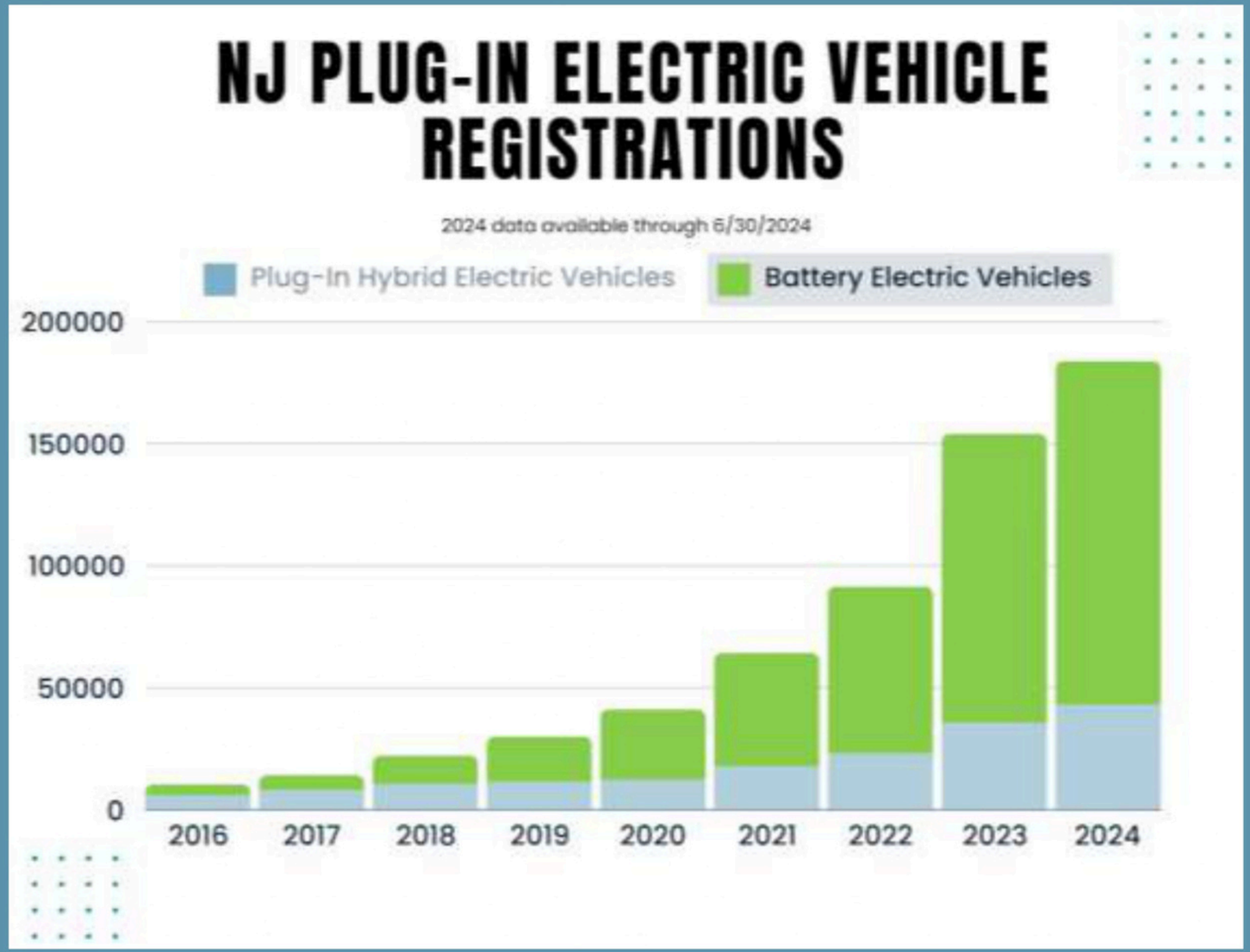
BPU Awards are leading the EV Revolution since 2021

- $27.2 — Over $27 million in awards
- 719 — Over 700 locations & awardees
- 2760 — Over 2700 Level 2 chargers
- 113 — Over 100 Fast Chargers
- 240 — Over 200 EVs for government fleets

Awards funded through NJBPU's Multi-Unit Dwelling, Clean Fleet and EV Tourism incentive programs



EV Registration



New Jersey's cleanenergy program™

Thanks to Clean Fleet, two of the five cheapest new cars on the market this year are EVs!

2024 Tesla Model 3

~~$27,990~~ → $16,490

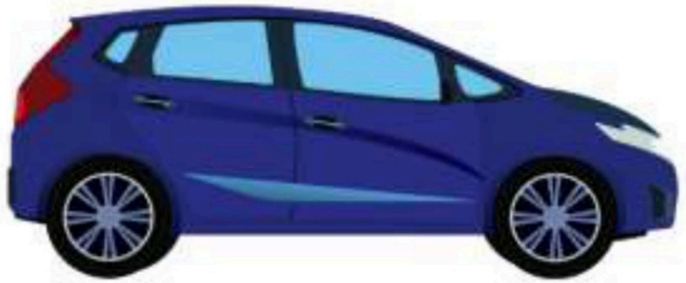


MSRP: $27,990 *

–	$ 7,500	**Federal Clean Vehicle Tax Credit**
–	$ 4,000	**Clean Fleet Incentive**
$16,490	Final price	
	Before taxes or additions	

2024 Nissan Leaf

~~$28,140~~ → $20,390



MSRP: $28,140 *

$3, 750	**Federal Clean Vehicle Tax Credit**	
$ 4,000	**Clean Fleet Incentive**	
$20,390	Final price	
	Before taxes or additions	

Cheapest New Cars **

1. 2024 Tesla Model 3 $16,490
2. 2024 Mitsubishi Mirage ES $18,160
3. 2024 Nissan Versa S $19,200
4. 2024 Nissan Leaf $20,390
5. 2024 Hyundai Venue SE $21,275

* MSRPs are obtained from the manufacturer's website and are current as of 10/01/2024.

** Conventional vehicle prices obtained from Cars.com April 22 list of the 10 Cheapest cars; EV prices were calculated by subtracting incentives from the MSRPs on the manufacturer's websites. The Cars.com list was re-order to reflect the lower EV prices.

ATLAS PUBLIC POLICY

R&D Products Strategic Advising Newsroom About

EV Charging Financial Analysis Tool

Last Feature Update: April 2019

Tools & Dashboards



Vehicle Comparison Results

Vehicle Type	Internal Combustion Engine		Electric Vehicle		Net Savings with an EV
	Vehicle (Upfront Price)	7-Year TCO	Vehicle (Upfront Price)	7-Year TCO	
Compact Sedan	Toyota Corolla LE ($22,050)	$42,348	Chevrolet Bolt EUV* ($22,550)	$31,768	**$10,581**
Sedan	Toyota Camry SE Nightshade ($28,960)	$44,307	Tesla Model 3 ($38,990)	$44,180	**$127**
Compact SUV	Nissan Rogue SV ($29,700)	$44,209	Volkswagen ID.4 ($31,495)	$37,110	**$7,099**
Mid-Size SUV	Toyota Highlander L ($39,270)	$48,286	Tesla Model Y ($42,490)	$43,925	**$4,361**
Pickup Truck	Ford F-150 XL Supercrew ($43,515)	$50,622	Ford F-150 Lightning* ($42,495)	$47,797	**$2,825**

Vehicles are model year 2024, except those with an asterisk (*), which are model year 2023.

EV Charging Financial Analysis Tool – Atlas Public Policy (atlaspolicy.com)

NEW: EVs cost less to own than the most popular gas-powered vehicles – Atlas EV Hub

EV Charging Station Comparison

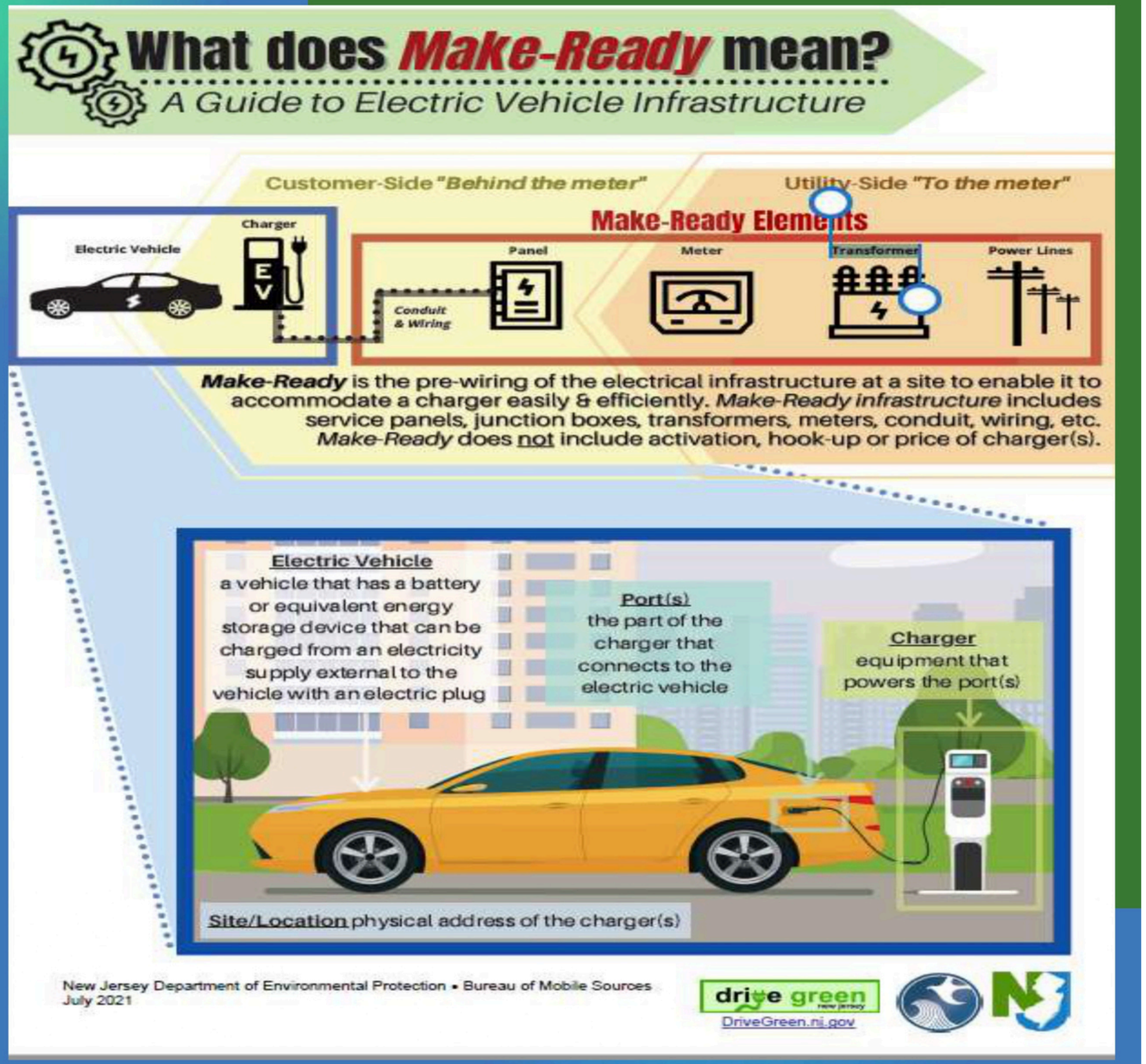


	AC Level 1	AC Level 2	DC Fast Charger
Voltage	120V 1-Phase AC	208V or 240V 1-Phase AC	480V 3-Phase AC
Suitable for Installation	Single-family Multi-family	Single-family Multi-family Commercial Municipal/Private Fleet	Municipal/Private Fleet Public Metro Areas Highway rest stops
Amps	12-16 Amps	12-90 Amps (typical 32 Amps)	<125 Amps (typical 60 Amps)
Charging loads	1.4 - 1.9 kW	2.5 - 19.2 kW (typical 7 kW)	<90 kW (typical 50 - 350 kW)
Charge time for vehicle	3-5 miles of range per hour	10-20 miles of range per hour	80% charge in 20-30 minutes
Best for	6+ hour or overnight charge	2-6 hour dwell times	High turn over
Station hardware cost	$500 - $1,000 per port	$600 - $5,000 per port	$7,000 - $50,000 per port

Adapted from NYSERDA

Make Ready

The infrastructure required to power an EV charger is called the Make-Ready work. By the end of 2022 all 4 electric utilities will provide programs to incentivize those costs.



Utility Programs

Currently Covered

- Make Ready for residential, L2 workplace, L2 MUD, L2 public and DCFC public chargers
- No utility ownership until Areas of Last Resort
- Demand Charge Solution
- Can cover no more than 90% of total cost of project with federal, state and utility funding
- Must be a universal charger, proprietary charges must be collocated, receive smaller incentive
- Data sharing

Potential Future Actions

- Fleet charging is proposed to be addressed in future Board proceedings on Medium and Heavy-Duty Charging
- Proposal includes utilities providing incentives for charging for public and publicly accessible transportation.
- Proposal includes utilities providing technical planning services for fleets and public chargers over 500kW.
- Proposal includes managed charging programs.

Over $215 Million in Funding Available

CLEAN FLEET EV & CHARGING INCENTIVE

NJCLEANENERGY.COM/EV

Award Caps

Municipalities, Local govt' entities, schools, non-profits serving	EVs	Charging Stations
serving populations < 20,000	4	2
serving populations > 20,000	10	4
serving populations < 50,000	14	8
serving populations > 100,000 *including state, colleges, universities & counties*	20	15

Overburdened Municipalities (OBM) are eligible for a 50% bonus.

Do you know about Federal Direct Pay?

- Tax-exempt and governmental entities that do not owe income taxes can now receive a **payment equal to the full value of clean energy tax credits**.
- Tax credits earned through Elective Pay **can be combined with DOE grants and loans** with some limitations.
- Eligible entities must complete a **pre-filing registration** and then claim the credit by filing a tax return with the IRS after the project or property is placed in service.
- **12 of the Inflation Reduction Act clean energy tax credits** are eligible for elective pay including:
  - Credit for clean commercial vehicles (§45W)
  - Credit for EV chargers installed in low-income or non-urban areas (§30C)
  - See the full list of elective pay eligible credits in the Tax Credit Overview section or at: https://www.irs.gov/pub/irs-pdf/p5817g.pdf

These slides provides an overview of certain Inflation Reduction Act tax provisions for general informational purposes only and **is not itself tax guidance**.
The content in this presentation is based on proposed and temporary regulations and other tax guidance on IRS.gov.
This deck relies on simplifications and generalizations to convey high-level points about Inflation Reduction Act tax provisions. Please **refer to guidance** issued by the IRS for detailed information on the rules associated with Inflation Reduction Act tax provisions

Who is eligible under Treasury/IRS regulations?

Category	Eligible Entities
Tax-Exempt Organizations	Any organization exempt from income taxes under §501(a), including §501(c) and §501(d) organizations. Examples include: • Charities • Houses of worship and religious organizations • Colleges and Universities • Hospitals
State, Local Governments	States including DC, political subdivisions such as cities and counties, and agencies and instrumentalities of state and local governments such as school districts.
U.S. Territories	U.S. territories and their political subdivisions and agencies and instrumentalities
Tribes	Indian Tribal governments, Alaska Native Corporations, Tribal agencies and instrumentalities.
Public Power	Examples: Municipal electric utilities, rural electric cooperatives, and the Tennessee Valley Authority.

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How to claim and receive elective pay?

Identify Project	Complete Project	Register	File	Receive Payment
• Identify and pursue the qualifying project or activity. • You will need to know what applicable credit you intend to earn and use elective pay for.	• Complete project or purchase qualifying property and place it into service. • Determine your tax year, if not already known, to determine when your tax return will be due.	• Complete pre-filing registration with the IRS at https://www.irs.gov/credits-deductions/register-for-elective-payment-or-transfer-of-credits. • IRS will provide you with a registration number for each applicable credit property.	• File your tax return by the due date (or extended due date) • Provide registration number(s) on your tax return. • Use Form 990-T and the appropriate form for the underlying credit.	• Payment will be received after the return is processed.

These slides provides an overview of certain Inflation Reduction Act tax provisions for general informational purposes only and **is not itself tax guidance**.
The content in this presentation is based on proposed and temporary regulations and other tax guidance on IRS.gov.
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Cross-Cutting Provisions /Bonuses

Tax Provision	Description
Prevailing Wage and Apprenticeship (PWA) Requirements	For a number of the tax credits created or modified by IRA, the base credit amount is increased by five times for projects that meet requirements for paying prevailing wages and using registered apprentices.
Energy Communities Bonus	Projects located in historical energy communities, including areas with closed coal mines or coal-fired power plants, are eligible for a 10 percent increase in the Production Tax Credit (§ 45, 45Y) and an up to 10 percentage point increase (if PWA requirements are met) in the Investment Tax Credit (§ 48, 48E). The bonus is also available to brownfield sites and to areas that have significant employment or local tax revenues from fossil fuels and higher than average unemployment.
Low Income Communities Bonus Credit Program *Application required*	Provides an additional investment tax credit for small-scale solar and wind (§ 48(e)) or clean electricity (§ 48E(h)) facilities (<5MW net output) on Indian land, federally subsidized housing, in low-income communities, and to benefit low-income households. Additional credit is 10 or 20 percentage point increase on base Investment Tax Credit (§ 48, 48E). You must apply and receive a capacity allocation, and then place your facility in service to claim this bonus.
Domestic Content Bonus	Projects or facilities that meet domestic content requirements are eligible for a 10 percent increase to the Production Tax Credit (§ 45, 45Y) or up to a 10 percentage point increase (if PWA req's met) to the Investment Tax Credit (§ 48, 48E). For projects or facilities beginning construction starting in 2024 or later, for taxpayers using elective pay, the domestic content requirement can also result in a reduction of the Production Tax Credit or Investment Tax Credit if it is not met.

These slides provides an overview of certain Inflation Reduction Act tax provisions for general informational purposes only and **is not itself tax guidance.**
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More Information

Cathleen Lewis
Clean Transportation Programs
Manager Cathleen.Lewis@nj.bpu.gov

Visit NJCleanEnergy.com
Newsletter
NJCleanEnergy.com/NEWSLETTER
Listservs
NJCleanEnergy.com/LISTSERVS

@NJCleanEnergy

United States EPA Funding Opportunities for Emissions Reductions

Diesel Emissions Reduction Act (DERA) National Program

- Previous round closed on December 1, 2023
- EPA anticipates awarding a total of approximately $115 million under this NOFO: $58 million in Fiscal Year (FY) 2022 funding and $57 million in FY 2023 funding, subject to the availability of funds, the quantity and quality of applications received, and other considerations.
- Selections have been made and award announcements will be out soon
- Announcement for FY'24 funding not made yet
- Check Here for program updates

DERA State Program

- Through State entities (NJ Department of Environmental Protection, NYS Department of Environmental Conservation), $26 million available for the State Program
  a. State Base - $336,226
  b. State Matching Bonus - $168,113
  c. FY24 Base and Bonus - $504,339
- Application period closed for FY'24 funding
- Check Here for program updates

Clean Heavy-Duty Vehicles Program

- The EPA anticipates awarding up to $932 million in competitive grant funding under the 2024 Clean Heavy-Duty Vehicles Grants Program Notice of Funding Opportunity. The program solicited applications nationwide for a grant competition to fund the replacement of existing non-zero-emission Class 6 and 7 heavy-duty vehicles with zero-emission Class 6 and 7 heavy-duty vehicles.
- Split into School Bus and Vocational Vehicles Sub-Programs
- Application closed July 25, 2024
- Reviews are underway, award announcements currently planned for November/December 2024
- Check Here for program updates

Clean School Bus Program

- Rebate opened September 26th, 2024
- Closes January 9th, 2024
- EPA anticipates awarding $965 million this round
- ZE – Class 7+ - up to $325,000 for buses serving disadvantaged school districts (Includes bus and charging infrastructure)
- ZE – Class 7+ - up to $170,000 for buses NOT serving disadvantaged school districts (Includes bus and charging infrastructure)
- Check Here for online rebate forms and more information

Thank You

Contact Info: Julia Krist
krist.julia@epa.gov

PATH TO ZERØ

FLEET ELECTRIFICATION WORKSHOP



Dawn Neville
Manager, Electric Transportation
PSE&G



Jacob Sneeden
Sr. Manager Regulatory Strategy
Exelon



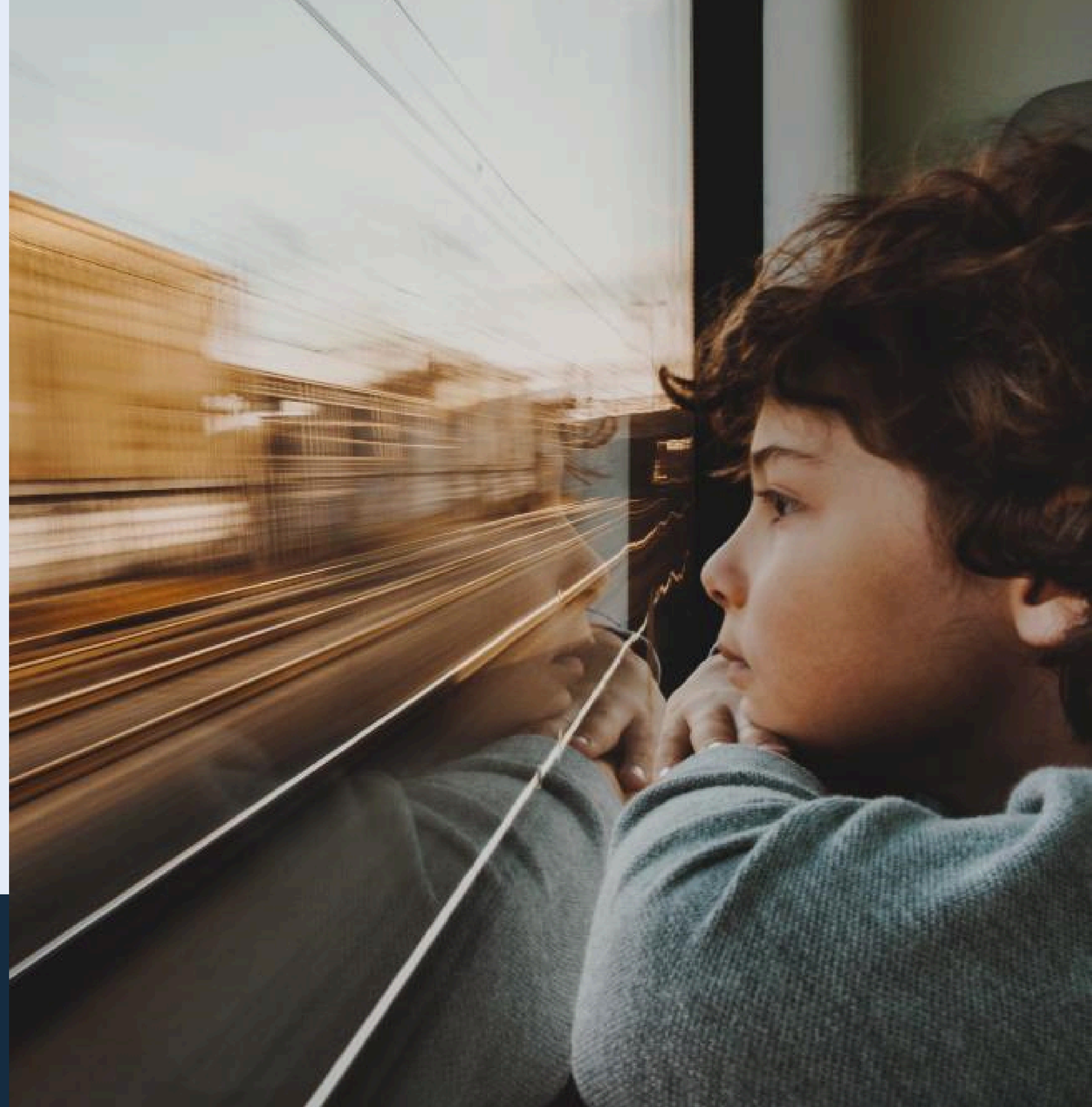
Joe Nash
E-Mobility Specialist
Orange and Rockland Utilities, Inc.

Unsure

We Put the *E* in Electric Vehicles

Dawn Neville

Manager Electric Transportation



Unsure

Powering Progress

Our vision to power a future where people use less energy, and it’s cleaner, safer and delivered more reliably than ever.

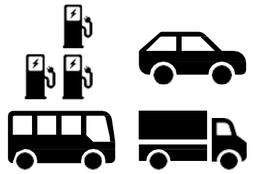
Unsure



Uncategorized or classified data – please select an appropriate label

EVs and Data Centers will add significant electric demand

1-3 MW



Initial Service Requests

5+ MW



Sports Stadium

9+ MW



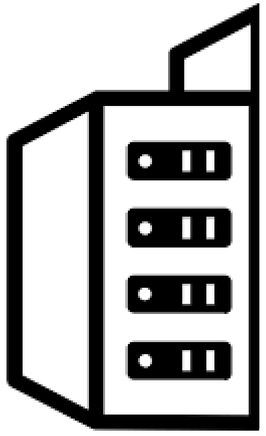
Bus Depot
150 Buses

9-10 MW



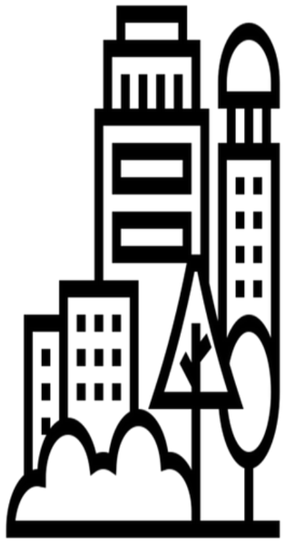
Empire State Building

15+ MW



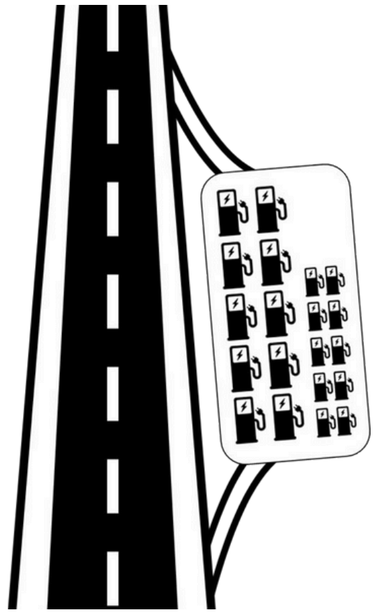
Data Center
Average

20+ MW



Large Town

25+ MW



MD/HD Highway Plaza
15 x 350 kW +
10 x 2 MW Chargers

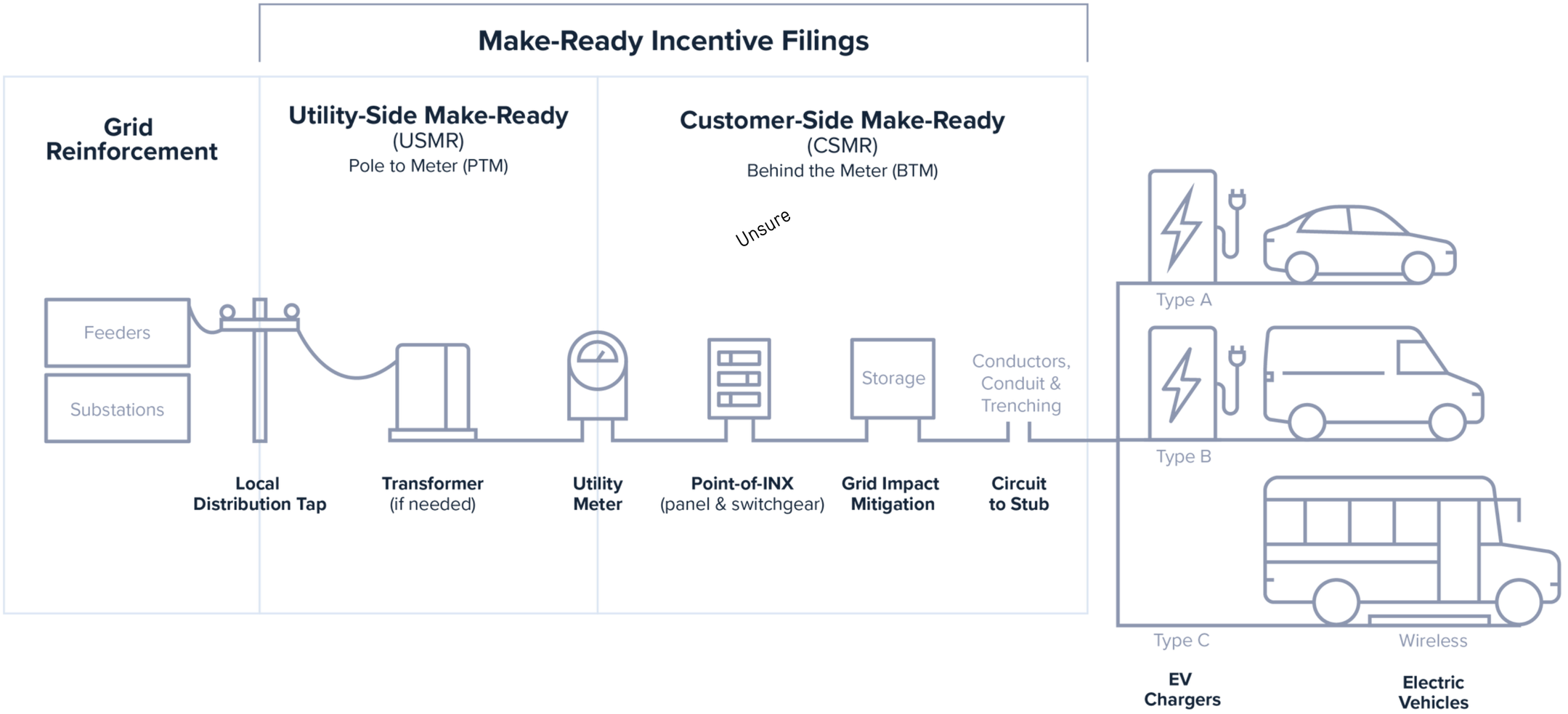
50+ MW



Data Center
Large

EV Make-Ready – Public/Private Partnership

Utility-Side vs. Customer-Side



PSE&G Electric Vehicle Program
Light-Duty Vehicles (LDV)

Residential Smart Charging		Level 2 Mixed Use Commercial Charging		Public DC Fast Charging	
Single Family Homes		Multi-Family, Government & Publicly Accessible		Travel Corridors & Community Locations	
$80M Investment	40,000 chargers	$35M Investment	875 sites ~3,500 chargers	$45M Investment	300 sites ~1,200 chargers
Incentives include*: • Up to $1,500 toward Customer Side Make-Ready (CSMR) installation costs for a residential Level 2 charger • Up to $5,000 Utility Side Make-Ready (USMR) costs for utility service upgrades (if needed) • Credit on charging during off-peak periods to help lower your bill		**Incentives include*:** • Up to $30,000* toward Customer Side Make-Ready (CSMR) costs associated with the installation of commercial Level 2 chargers • Up to $10,000 Utility Side Make-Ready (USMR) costs for utility service upgrades (if needed)		**Incentives include*:** • Up to $100,000** per site for Customer Side Make-Ready (CSMR) costs associated with the installation for DCFC chargers • Up to $50,000 Utility Side Make-Ready costs for utility service upgrades (if needed) • Demand Charge Rebates to help lower your electricity bill	

Investment
$166M
~6 Year Program

Development of smart charging infrastructure to facilitate EV adoption across a broad range of customers and segments

Expected Benefits



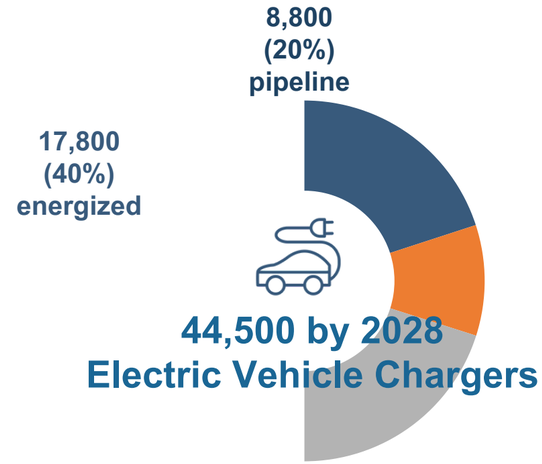
Mitigation of EV market barriers & reduction in range anxiety

an electric mile is **70%** cleaner than an average mile fueled by gasoline

14 million metric tons of CO_2 avoided through 2035

270 direct clean energy jobs

Advances NJ clean energy and EV goals

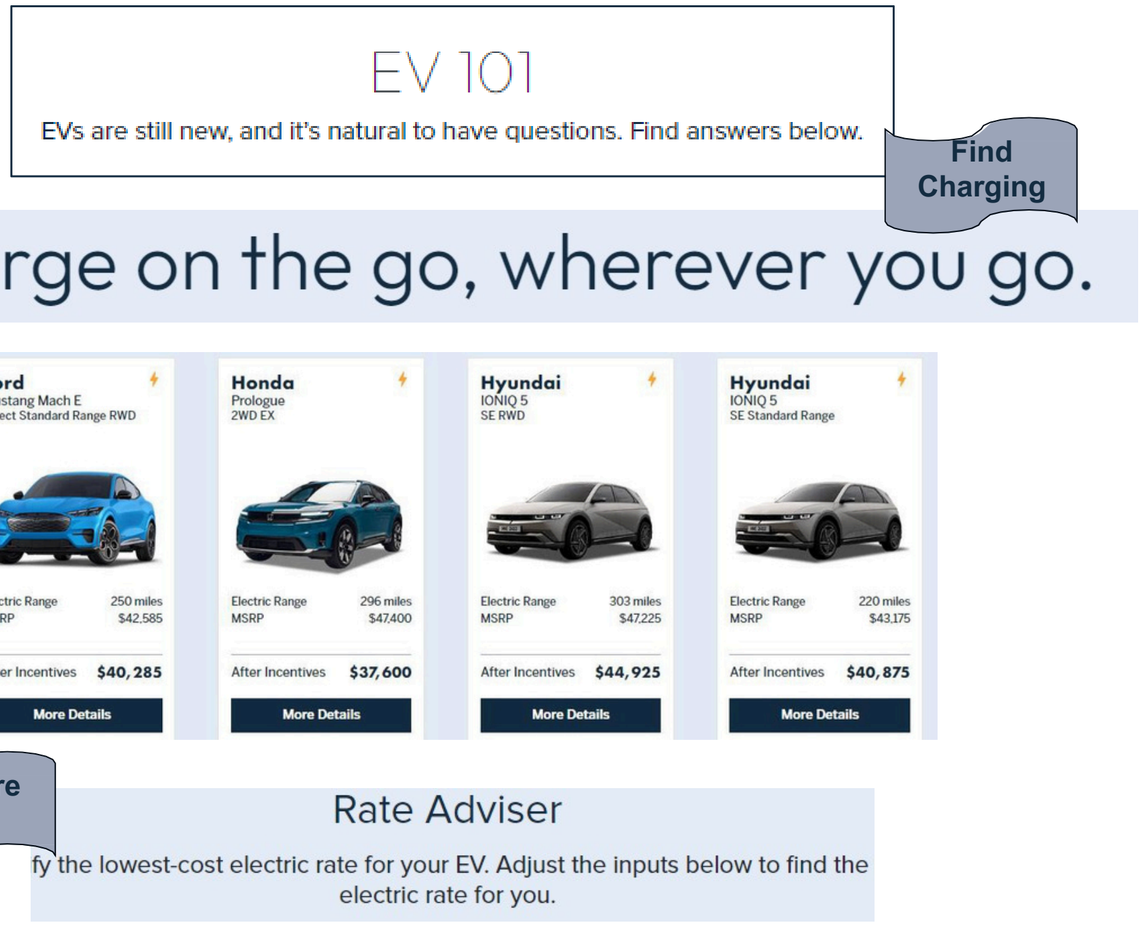


EV Education & Outreach

evadviser.pseg.com

Survey	Category	Example customer comment	Action Plan
Rebate	Confusion	• EV information is very confusing…it's very hard for first time EV buyer to navigate through the process…	• Developed interactive educational website





Medium/Heavy Duty (MHD) Vehicles

Four suggested primary segments

1. Public Transportation & Public Charging
    - Make-ready incentives for public serving transportation
    - Make-ready incentives for publicly-accessible chargers
2. Private Charging Solution
    - Make-ready incentives for fleet charging subject to eligibility criteria
3. Fleet Advisory Services
    - Technical and planning services to help fleet customers convert to electric vehicles
4. Distribution Upgrades
    - Accelerating distribution upgrade projects in areas of large expected MHD-related load growth

Current GAP in New Jersey

- State and Federal awards are being issued for MHD vehicles, such as school buses
- Deadlines for implementation have been set
- There are no comparable investor-owned utility incentives to help with make-ready costs to stack with these grant awards

Advanced Clean Truck (ACT) Rule

NJ: December 2021

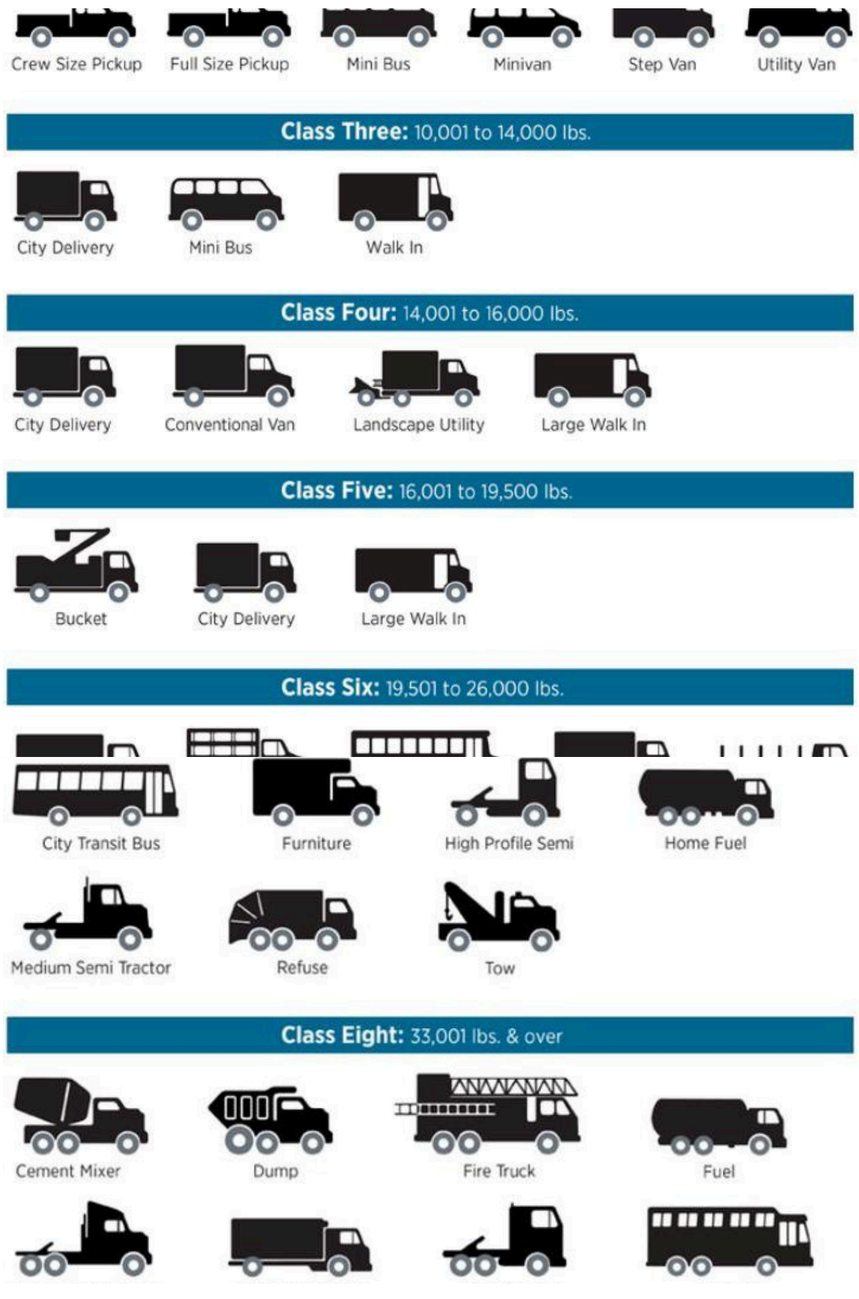
NJ Air Pollution Control Act, December 2021

- NJ adopted MHD rules that mirror California's ACT Rule
- Sets targets for the percentage of new truck sales that need to be zero emission (fuel agnostic) by year by vehicle weight class
- Vehicle manufacturers face non-compliance penalties

PSE&G Territory Data

- ~235k MHD vehicles registered
  - 46% of state total
  - 44% are Class 2b/light commercial
- ~8k school buses
  - 43% are Class 7 diesel buses
  - 25% are Class 3 gasoline buses

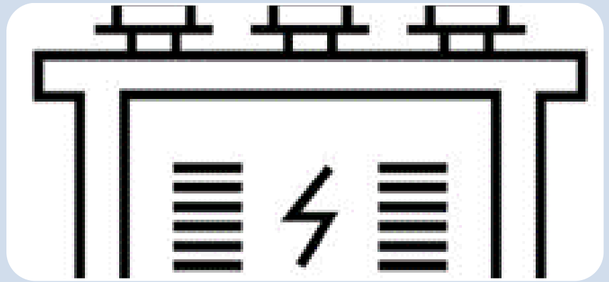
NJ Rules Start in 2025			
Year	2b-3	4-8	7-8
2024	5%	9%	5%
2025	7%	11%	7%
2026	10%	13%	10%
2027	15%	20%	15%
2028	20%	30%	20%
2029	25%	40%	25%
2030	30%	50%	30%
2031	35%	55%	35%
2032	40%	60%	40%
2033	45%	65%	40%
2034	50%	70%	40%
2035	55%	75%	40%



Typical Construction Timelines

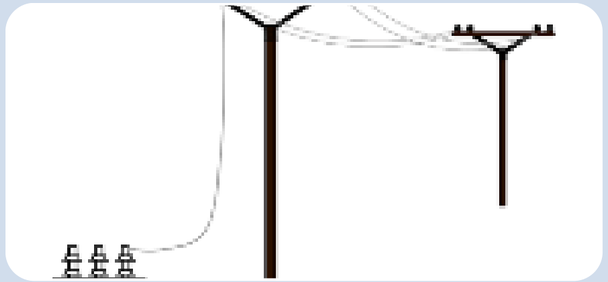
Issues that may impact schedule:

- Supply chain delays
- Site operations
- Easements
- Permitting
- Amperage and load requested
- Distance to available capacity



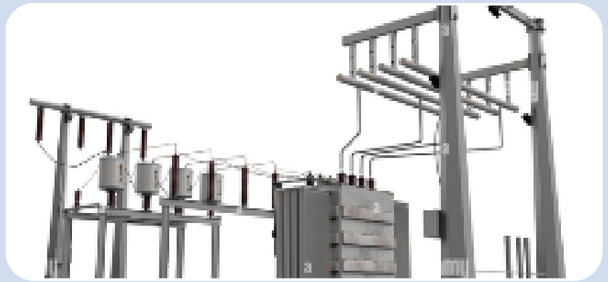
Distribution Transformer only

Averages*
6 months to 1 Year



Transformer and capacity

Averages*
1 to 3 Years



Distribution Substation

Averages*
5 to 7 Years

**Individual site timelines can vary significantly*

PSEG

Every EV Charging Infrastructure Project is a MAJOR construction project

Site	◦ Does the site already have electric service ◦ Will the site require new distribution or a service line extension ◦ Are there existing underground utilities (natural gas, gasoline, etc.) ◦ Are there environmental conditions of concern
Capacity	◦ Is there sufficient hosting capacity currently or will added capacity be needed ◦ How far into the grid does the upgrade work need to go
Permits & Clearance	◦ Are permits needed from Authorities Having Jurisdiction (AHJ), such as City, County, State or Federal Entities ◦ What permit approval times are expected within each AHJ
Materials & Equipment	◦ Key materials may have very long lead times, whether utility assets or customer assets ◦ Depending on the project size, the switchgear may be a customer asset
Customer Engagement	◦ Lead times in receiving customer applications, design submittals, providing clearances, signing agreements, submitting deposits, approving preliminary and final designs, etc. ◦ Customer requested changes after material decisions have been made

There are just a few high-level factors that influence how long an EV infrastructure project may take

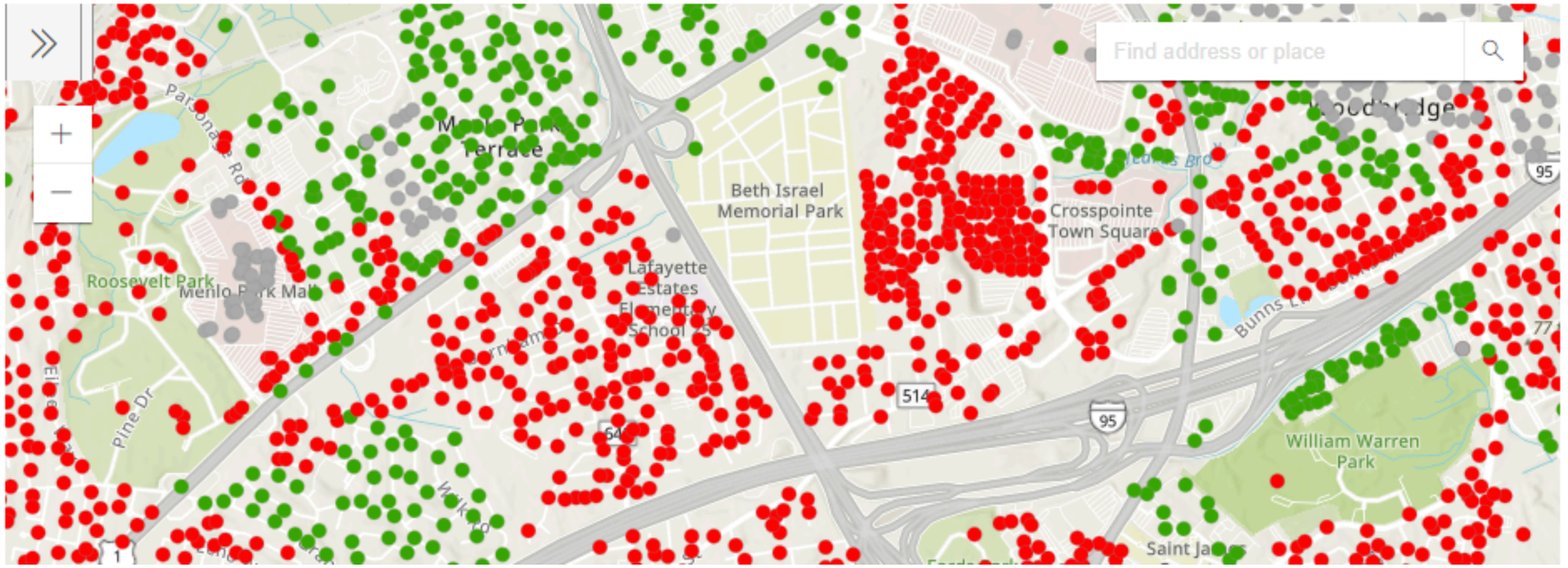
PSEG

PSE&G EV Hosting Capacity Map

[PSEG EV Hosting Capacity Map]

Capacity Map Color Legend:

Loading Capacity for 3-Phase Feeders	
----------	Analysis Pending
----------	> 1,000 kW Capacity Remaining
----------	500 kW to 1,000 kW Capacity Remaining
----------	< 500 kW Capacity Remaining



New Jersey Electric Distribution Companies

EDC	Acronym
Atlantic City Electric *An Exelon Company*	ACE
Jersey Central Power & Light *A FirstEnergy Company*	JCP&L
Orange & Rockland Rockland Electric Company	ORU / RECO
Public Service Electric & Gas	PSE&G



Contact List for EV-Related Information &

Utility	Utility-Specific EV Team	Utility Service Upgrade	Electric Rates and EV Charging Bill Impacts
ACE	For general Evsmart program questions email: Evsmart-ACE@ICF.com Or Email: Evsmart-ace@atlanticcityelectric.com	Visit Service Requests page or call the appropriate local engineering office for your location at: Cape May: 609-463-3823 Glassboro District: 856-863-7906 Pleasantville District: 609-645-4667 Winslow District: 856-753-2808	Email: Evsmart-ace@atlanticcityelectric.com
JCP&L	Visit: New Jersey EV Driven (firstenergycorp.com)	Visit: Establish or Upgrade Service	Email: NJEVDriven@firstenergycorp.com
ORU / RECO	Email: recoev@oru.com	Visit: https://www.oru.com/en/small-medium-sized-businesses/project-center	Email: recoev@oru.com
PSE&G	Email: PSEG-Electric.Vehicles@pseg.com	Visit: Upgrades and New Installations Or Email: PSEG-Electric.Vehicles@pseg.com	Email: PSEG-Electric.Vehicles@pseg.com

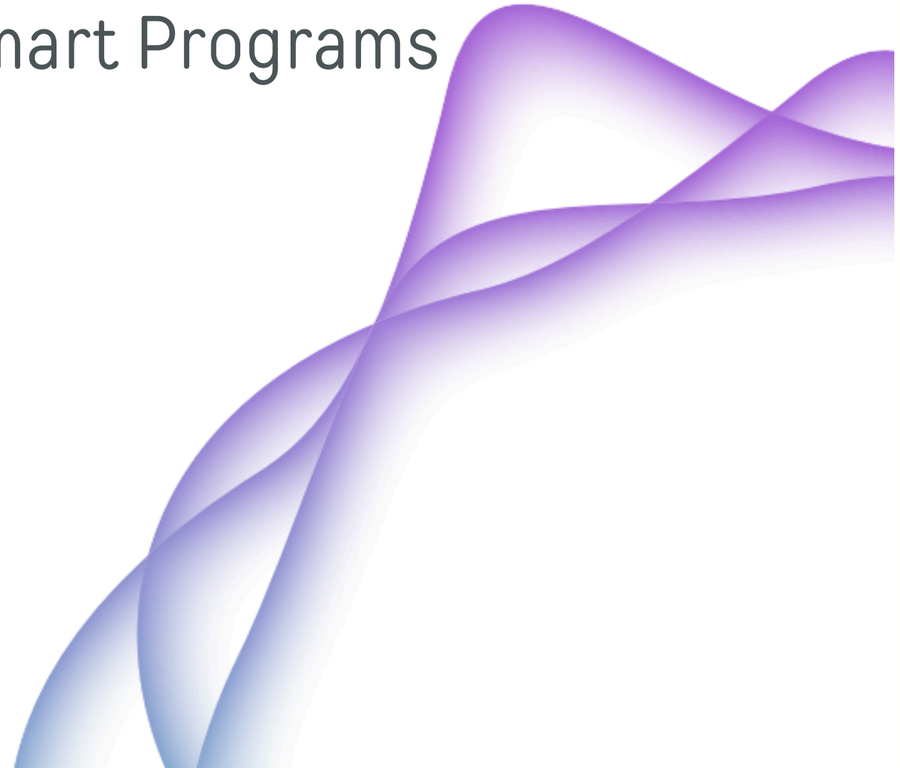
Talk to your utility

“Early and Often”

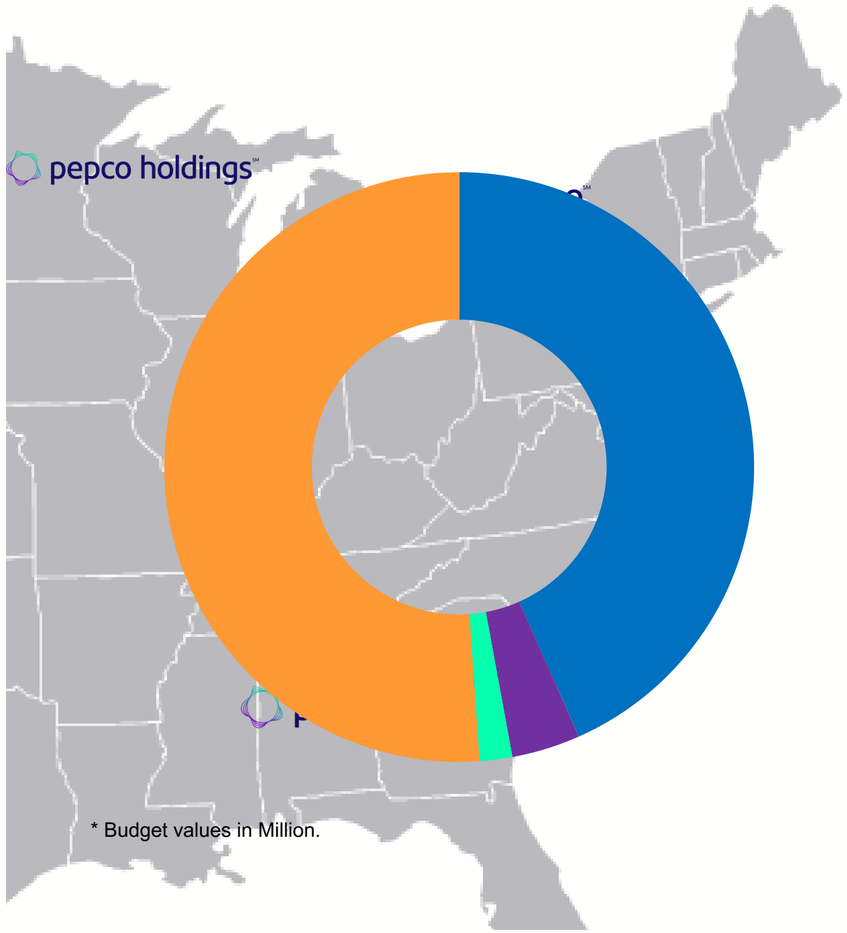
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Atlantic City Electric – NJ EVsmart Programs

Jake Sneeden
Sr Mgr of Regulatory Strategy



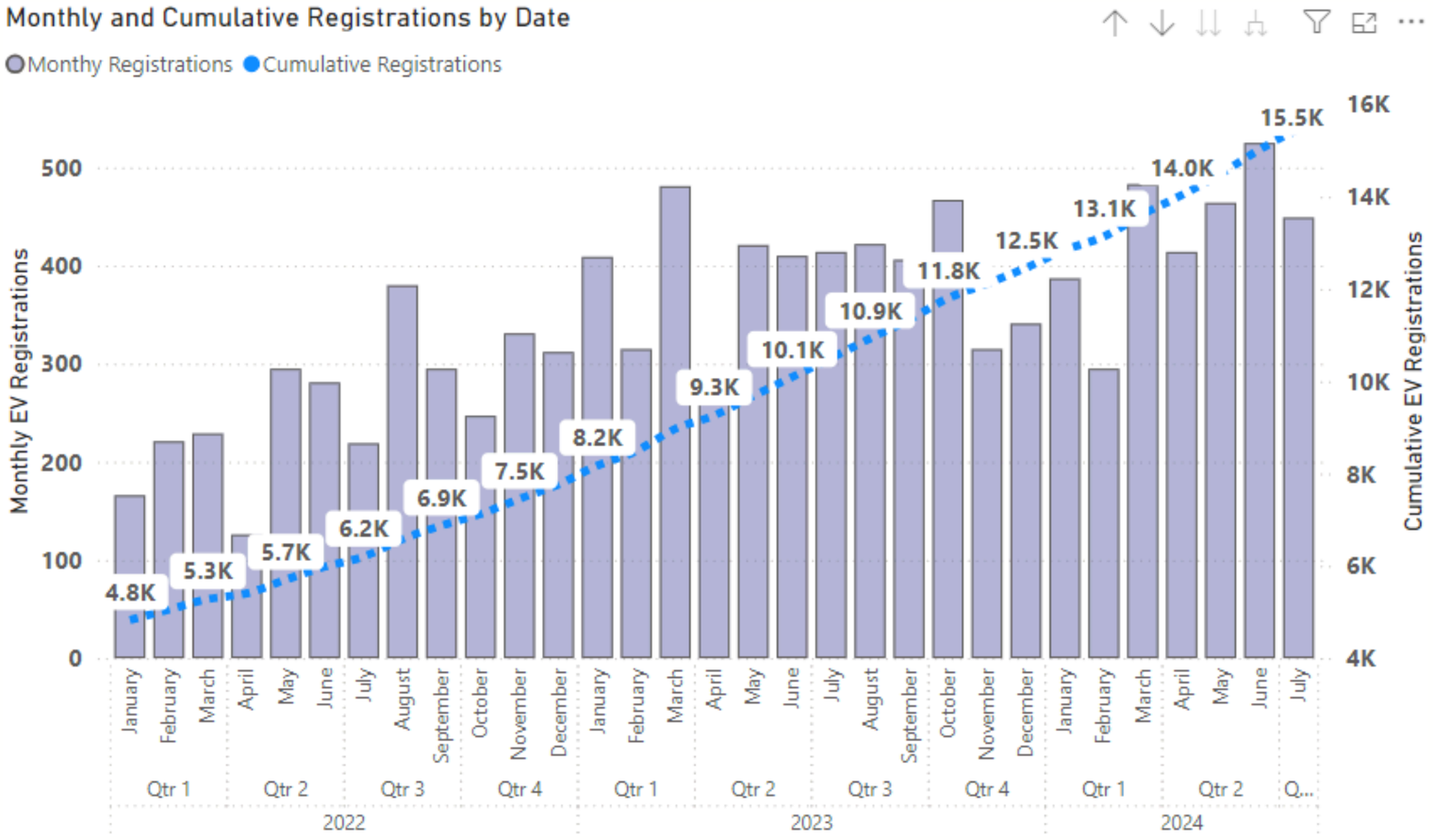
What is Happening around Exelon



- Transportation Electrification is a key priority for Exelon and Exelon's commitments to a Clean energy future.
- Exelon utilities are currently spending over $107M in transportation electrification (~BGE $46M, ComEd $4M, PECO $2M, PHI $54M)
- PHI constitutes the largest and longest standing programs in Exelon utilities, in operation since 2019
- Exelon utilities programs' origin vary from legislative order, public utility commission order, or direct utility filing, or grant filing

EVs in Atlantic City Electric

Electric vehicle (EV) growth in Atlantic City Electric's service area is accelerating, driven by initiatives and utility programs aimed at supporting New Jersey's clean energy goals.



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ACE EVsmart Background

- Atlantic City Electric (ACE) received BPU approval for a $20M EV Charging Infrastructure Program in February of 2021.
- The program supports New Jersey's goal of putting 330,000 EVs on the road by 2025.
- The program supports the installation of 3,250 electric vehicle charging ports both residential and commercial
- Helps to identify infrastructure needs and to inform on EV TOU rate options for EV customers.



EVsmart
LIFE, FULLY CHARGED

To learn more about electric vehicles and EVsmart Programs, simply scan the QR code.

Current Programs

Program Summary

Sub-Program	Charger Type	Sub-Program Incentives	Ports per Site
Residential	Level 2	50% of make-ready costs up to $1,000	1
Multifamily	Level 2	50% of make-ready costs up to $5,000/port	10
		100% up to $6,700/port in LMI communities	
Workplace	Level 2	50% of make-ready costs up to $4,500/port	10
Fleet	Level 2	50% of make-ready costs up to $2,500/port	10
Public	Level 2	50% of make-ready costs up to $4,500/port	2
	DCFC	90% of make-ready costs up to $60,000/port	2

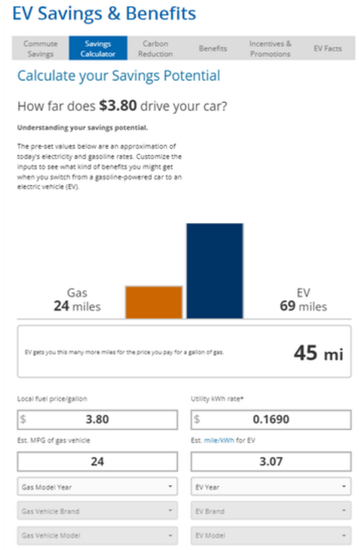
Rates Summary

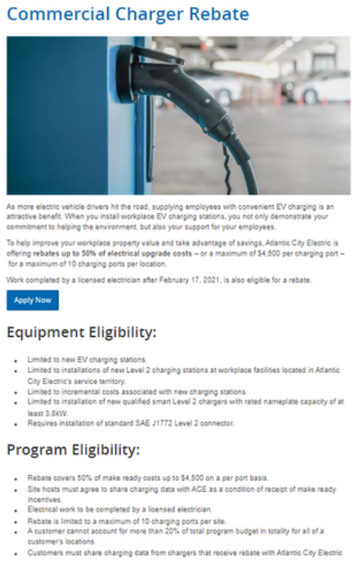
Rate Type	Program Description
DCFC Dedicated Distribution Rate	• Public DCFC charging providers can take advantage of a $.109/kwh rate option for distribution under the MGS-SEVC rate
DCFC BGS Pilot Program	• Public DCFC charging providers taking supply through ACE, and also enrolled in MGS-SEVC can participate in a two-year pilot program that eliminates demand chargers and allows customers to be billed on a kWh basis.

Looking Ahead

In the near term: ACE anticipates the next round of programs to be specifically targeted to Medium and Heavy-Duty ("MHD") fleets.

- Support for make-ready infrastructure
- Fleet assessment tools
- Hosting capacity and EV maps
- Dedicated support for fleet customers
- Dedicated rate options





On the horizon: Additional Opportunities exist where customers can work with ACE to support the grid and unlock additional value for their fleets

- Grid and economic impact analysis
- Managed charging programs
- Vehicle to Grid programs (V2G)



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What to Know About The Process

Fleet applications may require new service or an upgrade to the existing service at the site. Customers will need to work with their electrical contractor to design charging system infrastructure and submit an electric service application to the ACE Service Requests webpage which can be found here.

Planning and Design Process

Initiation 1

- Research charging and understand site needs
- Verify or establish your ACE account
- Work with electrical contractor to prepare and submit and ACE service application
- Work with electrical contractor to design the charging system infrastructure

Planning 2

- ACE reviews application and will advise the customer on service options
- ACE will carry out a site visit review existing infrastructure
- Initial design of utility equipment or upgrades is carried out
- Initial timeline estimate can be communicated to customers

- Utility side costs calculated and added to preliminary incentive

Design 3

- ACE completes design of electrical installation
- Permit Process – ACE applies for utility permits and customer works with electrical contractor to obtain any permits for construction
- Customer can start work on any behind the meter EV charging infrastructure

- Customer Receives approval to start work

Scheduling 4

- Company will work to schedule construction for utility infrastructure

Construction 5

- ACE performs site inspection to ensure site readiness
- Exelon constructs site infrastructure & installs service

Completion 6

Installation complete

- Customer communicates completion and receives Make-ready incentive

3–5 months

6+ months

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What You Can do Today



Engage with us early and often. This process requires transparency. We will need to know about any modifications to your service so we can stand ready to help make your vehicle electrification goals a reality



Plan your charge before your vehicle purchase. ACE is ready to help you start your EV journey and evaluate what is needed for your fleet procurement.



Perform an assessment. Do your own pilot. Understand your needs. Tailor a solution that fits into your needs.



Your electric bill will depend on how you charge. The cost of electricity depends on the fleet charging profile. In general, managing when the EVs charge, at what power level and for how long will lower the costs.



Leverage available support. The infrastructure needed to provide electricity to a given location is highly site-specific. The extent of service upgrades that may be needed will depend on a host of factors, including how many EVs will be charging concurrently and at what power level.

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ACE Support

We are here when you are ready to get started.

- Vernita Coverdale – Manager, Atlantic City Electric – Large Customer Service
  Vernita.Coverdale@delmarva.com
  (302) 451-5305

- Cory Harris – Program Manager, Atlantic City Electric – EVsmart programs
  cory.harris@pepcoholdings.com

- Link for ACE Service and Meter Application
- Link for ACE EV Page: https://www.atlanticcityelectric.com/EVsmart

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- For any program related questions please reach out to the EVsmart Team at:
  EVsmart-ACE@ICF.com
  Or call (855) 861-0151 option #4

- For General information on EVs, common questions and tools, please visit our website at
  https://www.atlanticcityelectric.com/EVsmart



Path to Zero

Rockland Electric Company (RECO) E-Mobility Programs and Initiatives

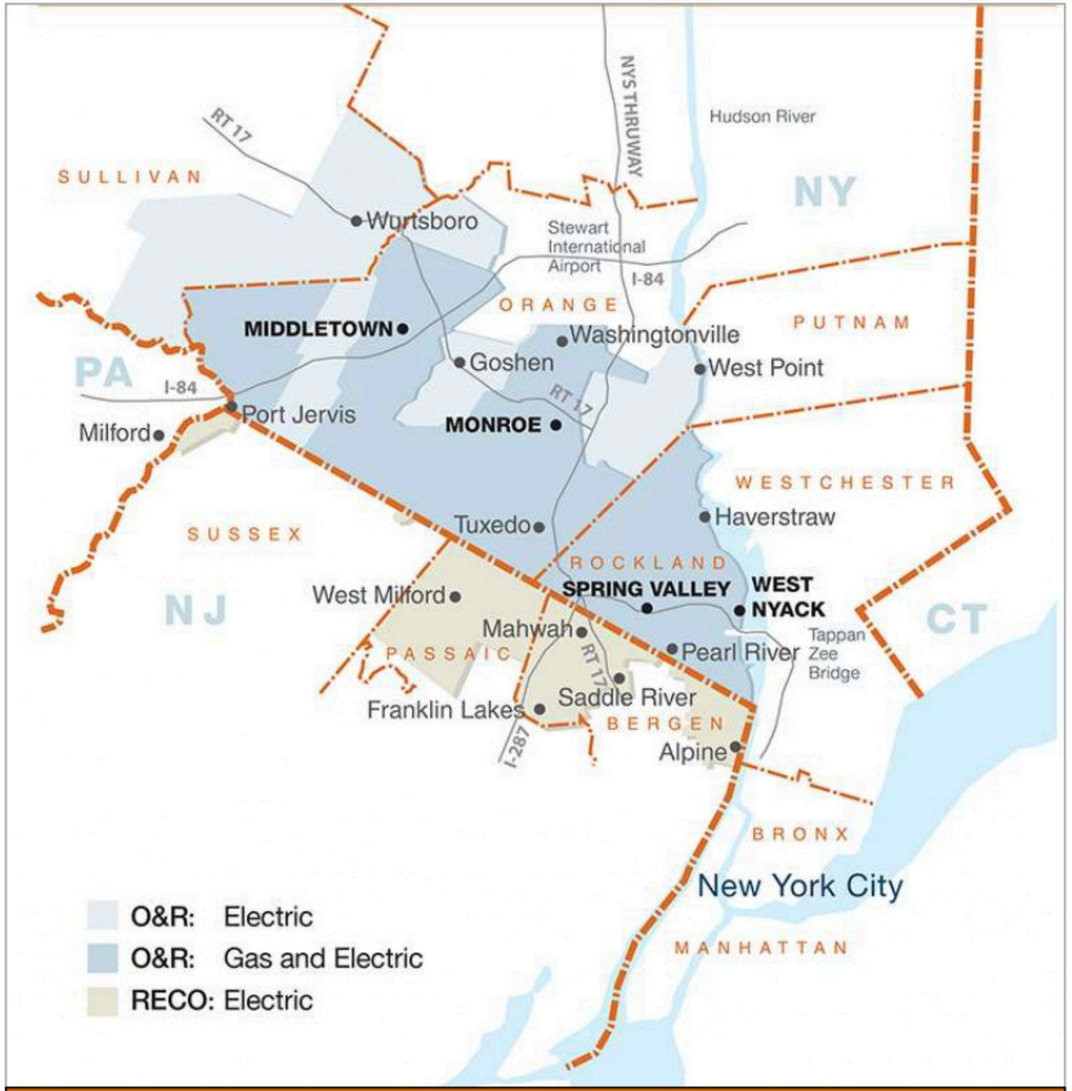
October 16, 2024

Joe Nash, Clean Energy Manager, E-Mobility

Rockland Electric Company

About Us

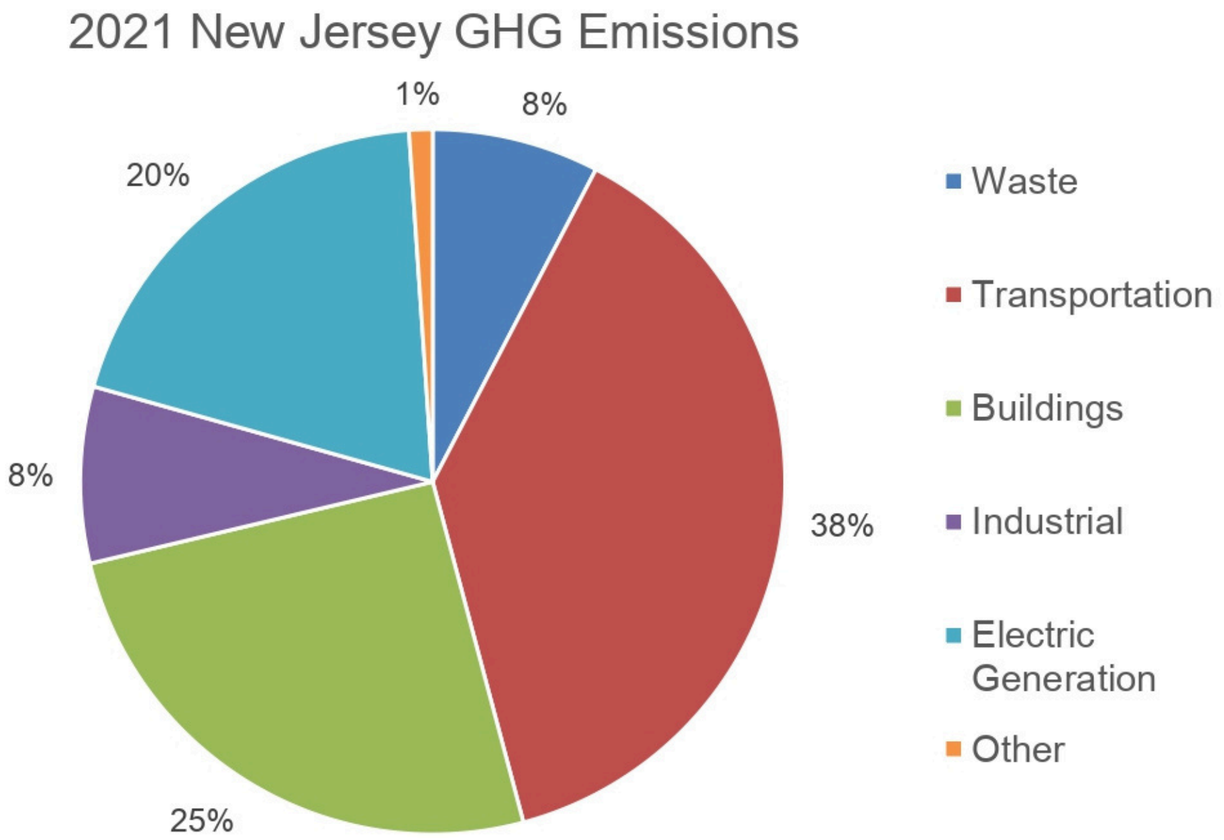
- Orange & Rockland (O&R) and its utility subsidiary, Rockland Electric Company (RECO), serve a population of approximately 1 million people in six counties in New York and northern New Jersey
- We employ nearly 1,150 talented, diverse, and dedicated women and men
- Our three priorities:
  - Safety is our top priority
  - Operational Excellence is at the core of our business
  - Providing an exceptional Customer Experience and helping to manage energy use in new ways



O&R provides safe and reliable service for 309,000 electric customers and 140,000 gas customers, throughout 1,300 square miles in New York and New Jersey.

Emissions

Transportation sector accounts for ~40% of emissions in New Jersey

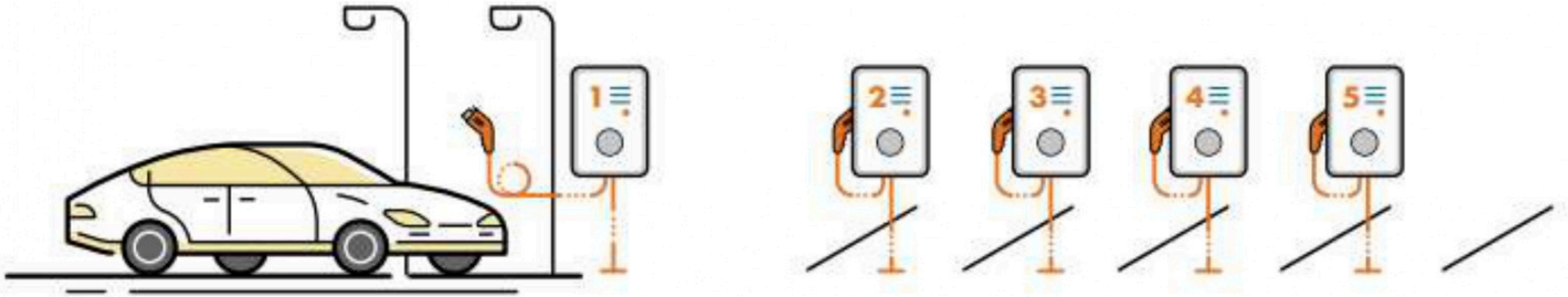


Source: NJ DEP
Note: Other includes halogenated gases, SF6, natural gas transmission and distribution system, agriculture, natural land clearing, and carbon sequestration

Company Policy

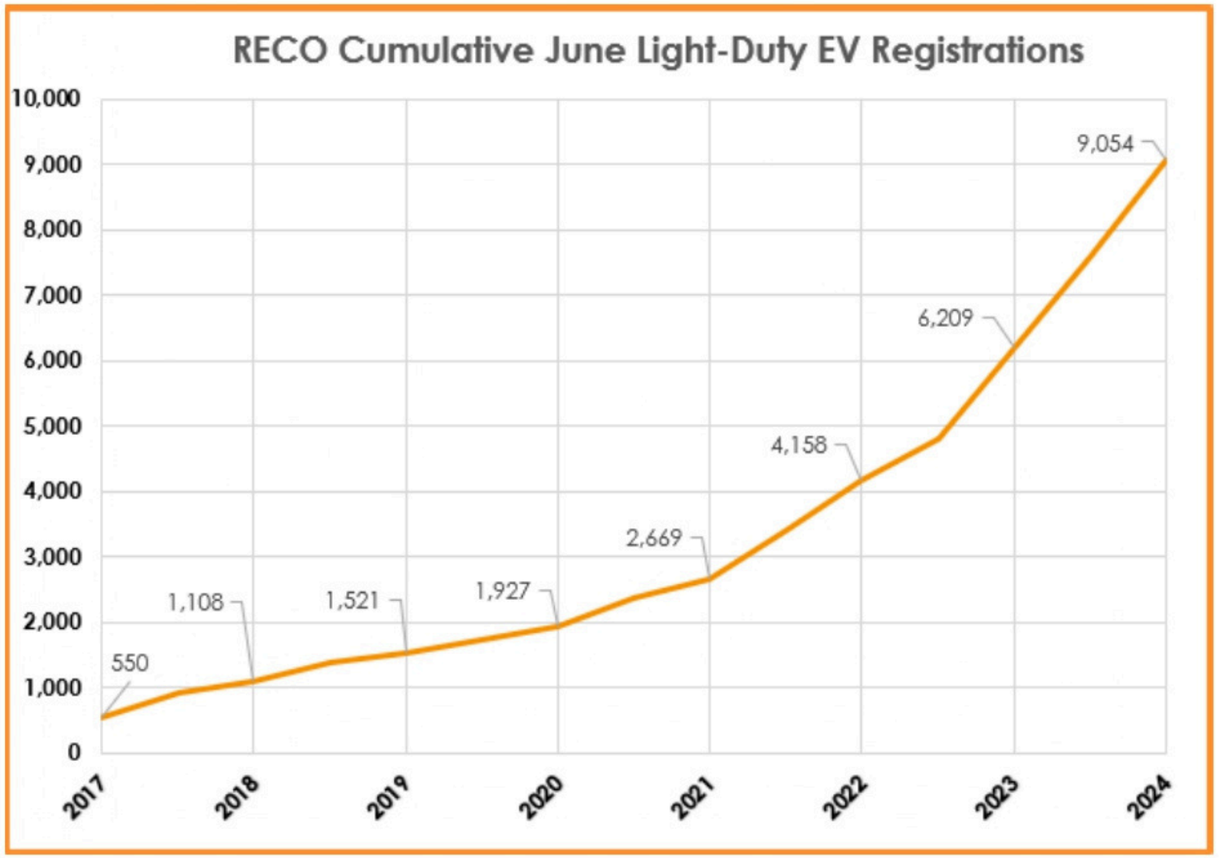
Changing company culture started with policy definition and proliferation

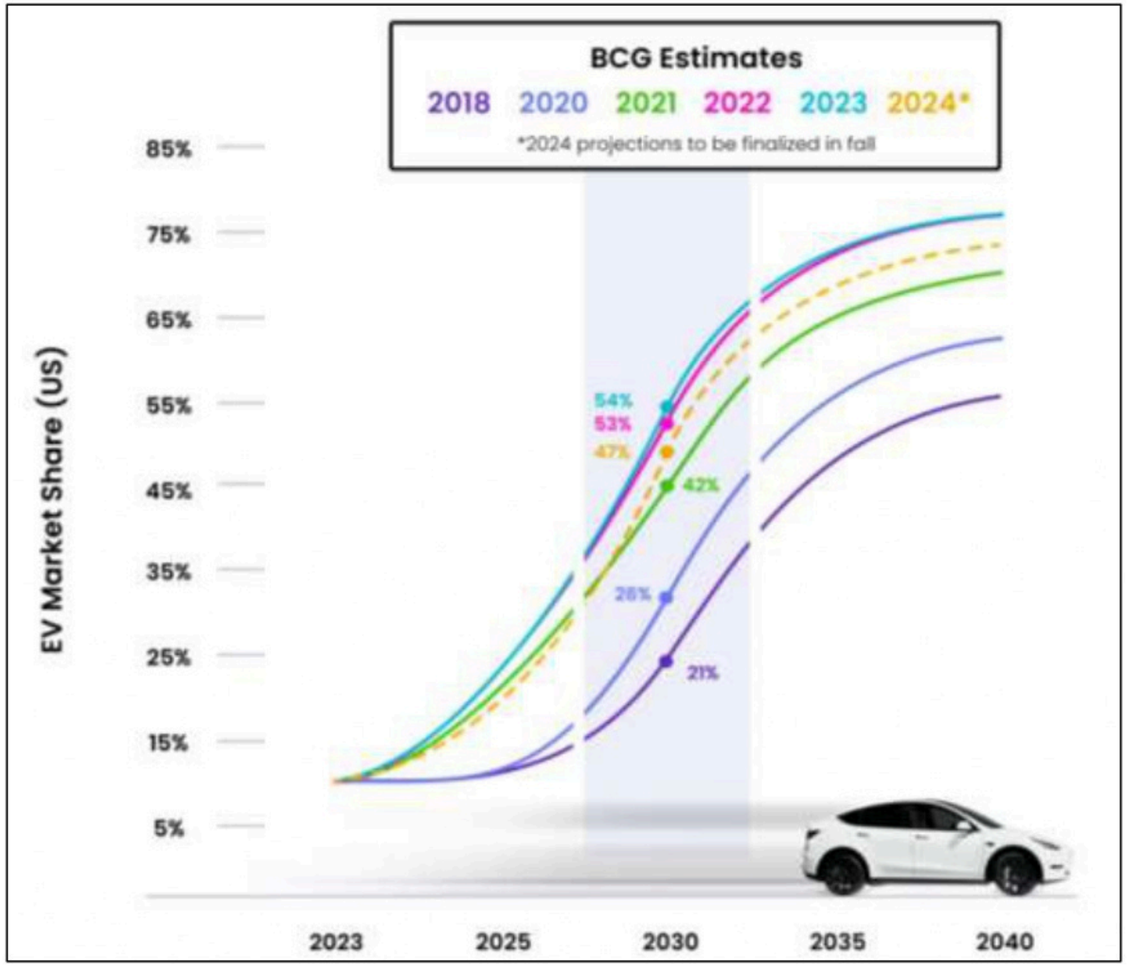
- **All in on electric vehicles**, we advocate policy change for 100% of vehicles sold by 2030 to be electric.
- Support our commercial customers and government partners as they transition fleets to electric, improving air quality, particularly in **overburdened communities**.
- Creating and promoting a culture of **grid efficient charging** behavior, primarily via managed charging, unlocking the least cost pathway to the clean transportation future.



EV Adoption

EV adoption is growing rapidly, while projected EV market share accelerates



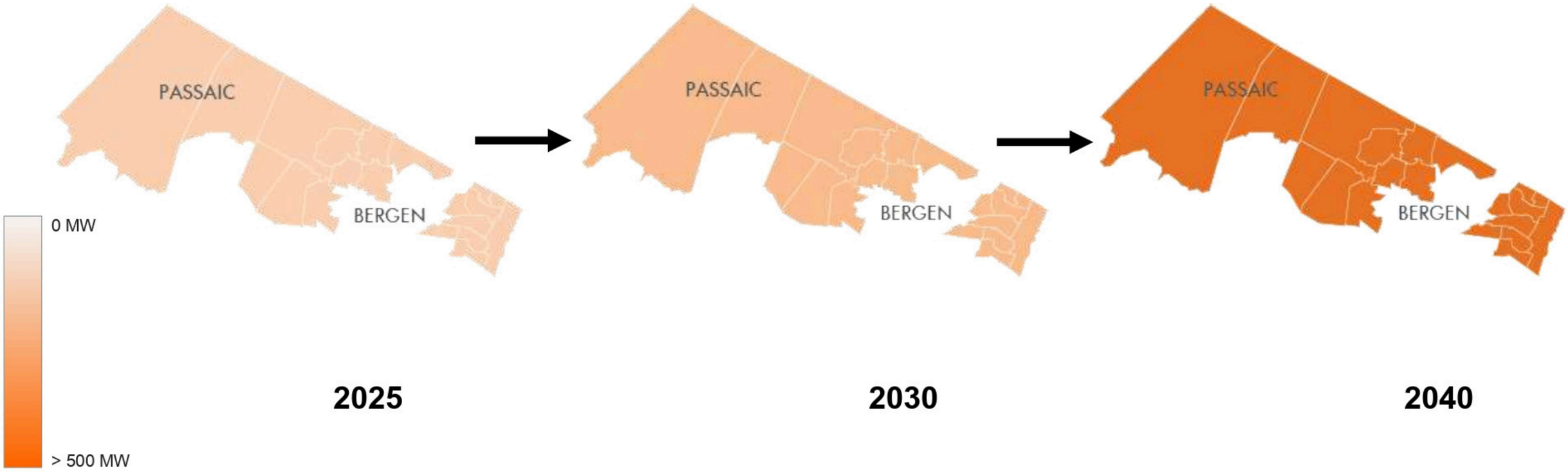


Note: BCG – Boston Consulting Group, industry leader in forecasting EV Adoption

Grid Capacity

EV load is expected to increase dramatically, adding ~300MW of demand by 2040

Maximum EV load (MW)[1]



Note: Maximum EV load may not be coincident with substation peak. Does not include potential NWA / Bulk Storage Activities

New Jersey EV Programs

RECO programs supporting New Jersey EV goals and promote EV adoption

- Charger Ready Program
- DCFC Incentive Program
- Residential Charger Rebate
- Voluntary Time-of-Day Rate
- Education and Outreach

RECO *proposed programs* to support New Jersey EV goals and promote EV adoption

- SmartCharge NJ
- Medium-Heavy Duty Make Ready Program
- Commercial Managed Charging



New York EV Programs

Orange & Rockland Utilities programs supporting New York EV goals and promoting EV adoption

- PowerReady Program
- Medium-Heavy Duty Pilot Program
- Fleet Assessment Services
- SmartCharge NY
- Time-of-Use Rates
- SmartCharge Commercial
- Demand Charge Rebate
- Education and Outreach



Electric Vehicle Infrastructure

Increase and accelerate deployment of chargers



- **PowerReady:** Can offset up to 100% of the electric infrastructure costs associated with installing light-duty L2 or DCFC chargers for commercial customers
- **Medium/Heavy Duty:** Cover up to 90% of the utility-side make-ready costs and in some cases up to 50% of the customer-side make-ready costs for eligible customers and investments in Disadvantaged Communities (DAC), for MHD fleet vehicles
- **Fleet Assessment Service:** Provides fleet owners with a site assessment and rate analysis to aid in preparation to transition to an electric fleet.



- **Commercial Charger Ready:** Incentives that will offset up to 90% of the electric infrastructure costs associated with installing EV charging stations
- **Charger Ready for Home:** Makes it more affordable for customers to install Level 2 EV chargers at their home by offsetting the costs of charging infrastructure

WORKPLACE CHARGING (NY + NJ)

O&R is dedicated to making the switch to electric easy for employees. Employees who sign up are charged a reduced kWh fee across our facilities.

Rockland Electric Company

Residential Charger Ready Program

Program Overview

Program Description	Provides incentives to offset customer and utility-side infrastructure costs associated with installing light-duty EV chargers
Funding	$1.8M
Program Dates	**Start:** December 19, 2022 **End:** December 18, 2026
Program Goals	**L2 Plugs:** 1,448
Resources	Website Email



Rockland Electric Company

Commercial Charger Ready Program

Program Overview

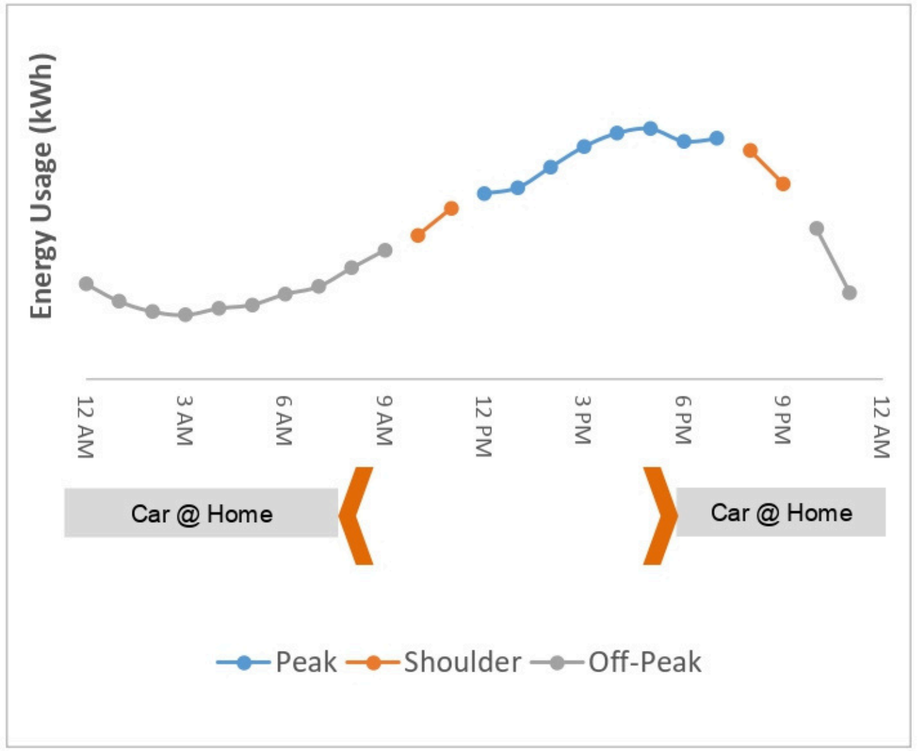
Program Description	Provides incentives to offset customer and utility-side infrastructure costs associated with installing light-duty EV chargers.
Funding	$3.4M
Program Dates	**Start:** December 19, 2022 **End:** December 18, 2026
Program Goals	**L2 Plugs:** 413 **DCFC Plugs:** 30
Resources	Website Email



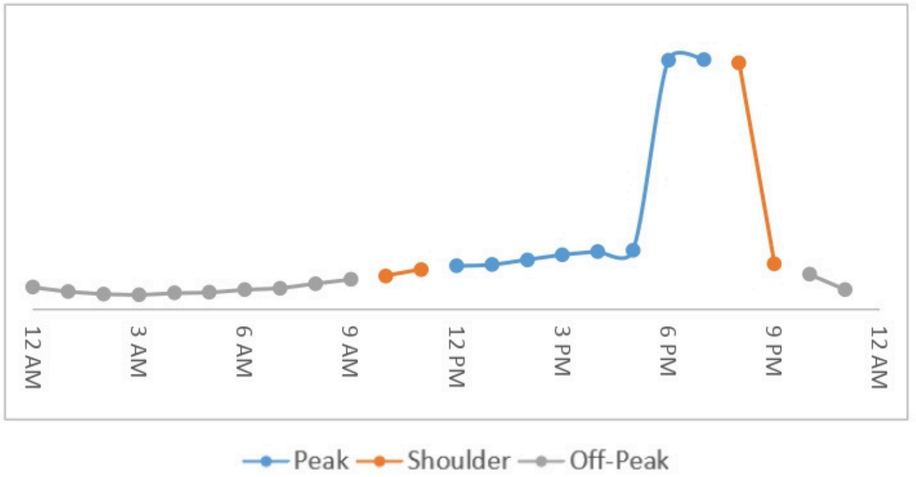
Managed Charging (SmartCharge NJ)

This program could shift EV load out of system and substation peak periods

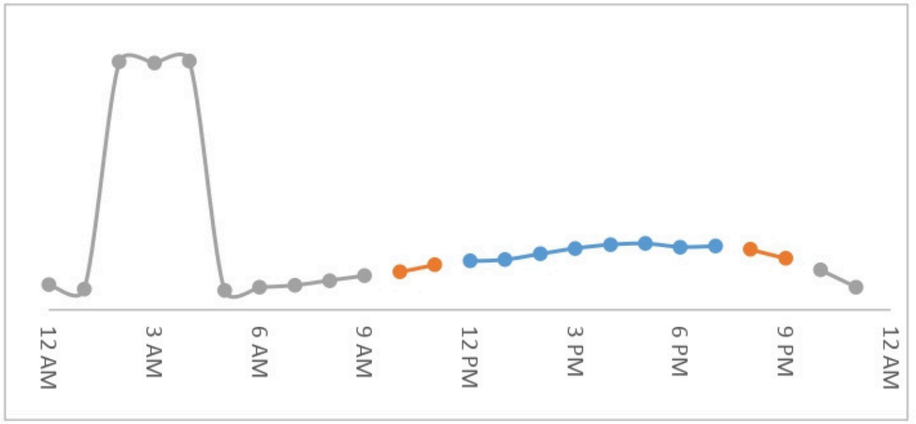
Average Single-Family Home
Summer Weekdays



EV Baseline Behavior



EV managed charging



PATH TO ZERØ

FLEET ELECTRIFICATION WORKSHOP

Vehicle

Charging

Tools

Advanced Technologies

Utilities

Funding