

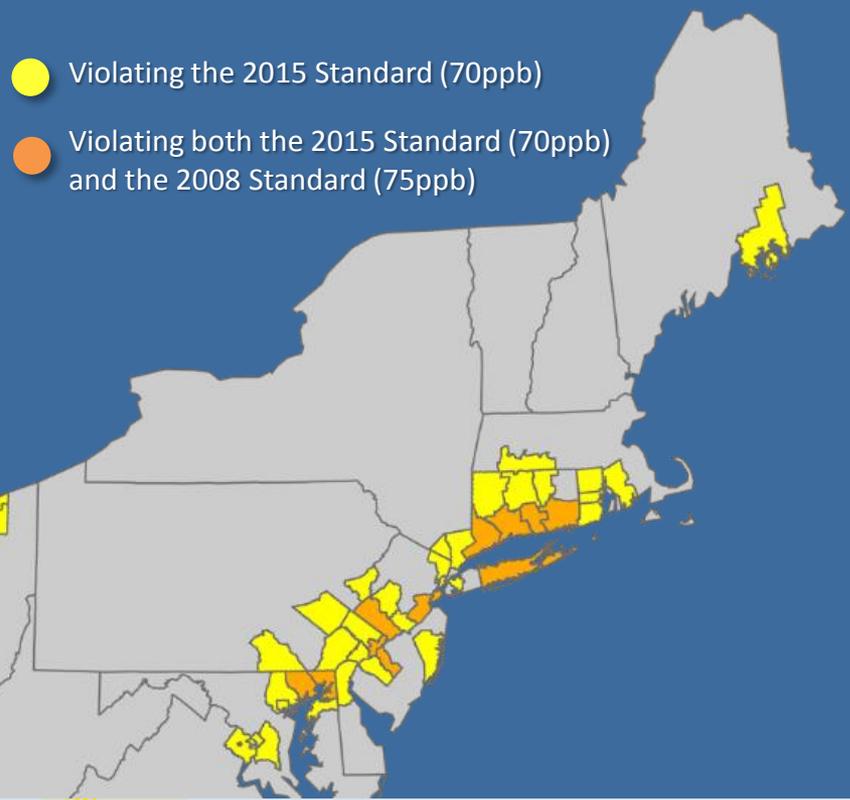


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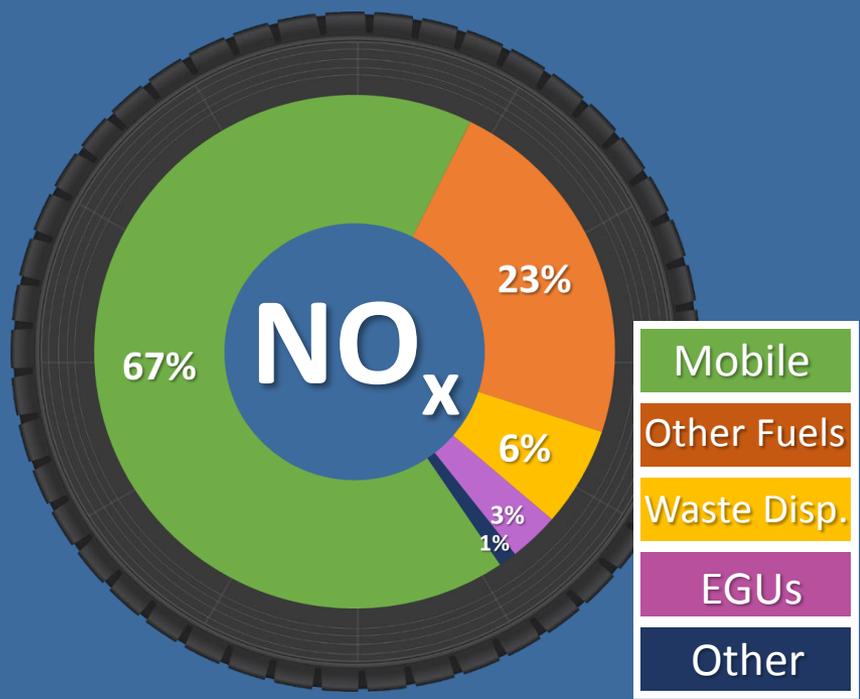


Electrification for Air Quality Challenges

Counties with Ozone Violations in 2017 Ozone Season

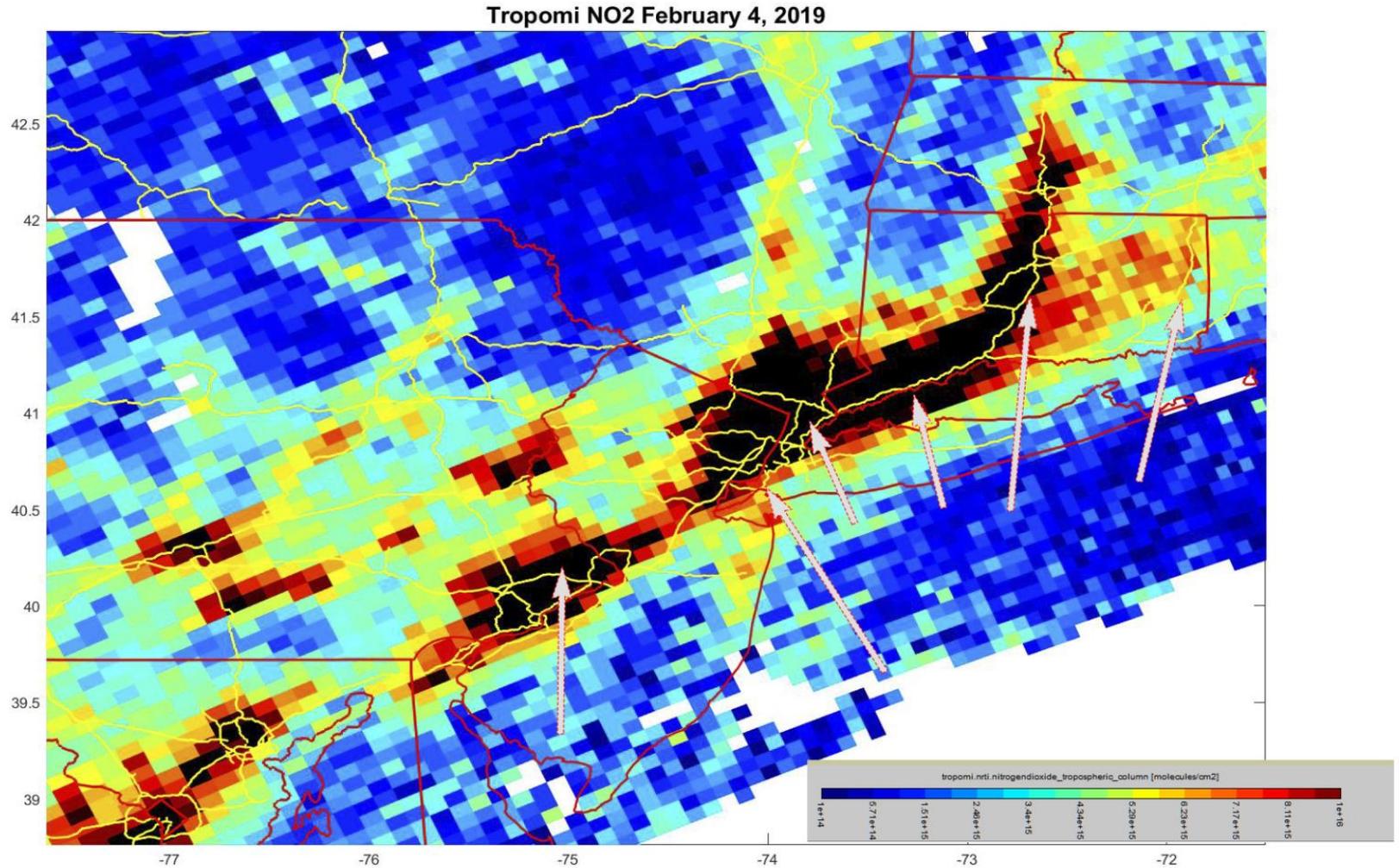


Mobile Sources account for 67% of all NOx emissions in CT (on-road and non-road)



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Transportation Related NOx



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EV drivers in Connecticut

- Regulatory
 - California LEV, ZEV, and GHG rules
 - Connecticut is a “CAA sec. 177” state
- Regional
 - Multi-State ZEV MOU
 - Eight states; 3.3 Million ZEVs by 2025
- Statutory
 - Connecticut Global Warming Solution Act targets



LEV Program Structure and Goals

- Requires conventional vehicles to meet fleet average emission requirements
- LEV III standards will bring vehicles 73% cleaner than 2004 vehicles by 2025



- Requires fleet average CO₂/mi requirements to reduce gasoline use and decrease GHG emissions
- Harmonization between California and Federal GHG and NHTSA fuel mileage requirements a result of 2013 negotiations now on hold pending recent EPA/FHWA proposed rules

- Requires manufacturers to bring advanced technology vehicles to market
- Complicated but flexible compliance framework
- Active regulatory schedule with CARB set to revisit post 2025 ZEV targets

How ZEV Works

Goal: to bring about the commercial viability of advanced technology vehicles

Requirement: Deliver for sale a certain percentage of advanced technology vehicles to CT each year as a percentage of their total fleet delivery

- Vehicles can be of two categories:
 - Zero Emission Vehicles (battery electrics, FCEV)
 - Transitional (TZEV), plug-in hybrid vehicles
- Vehicles delivered for sale earn credits based on technology factors (vehicle range, time to fuel/charge, etc.)



What the Requirement Looks Like

Model Years	Total ZEV Percent Requirement	Minimum ZEV floor	TZEVs
2018	4.5%	2.0%	2.5%
2019	7.0%	4.0%	3.0%
2020	9.5%	6.0%	3.5%
2021	12.0%	8.0%	4.0%
2022	14.5%	10.0%	4.5%
2023	17.0%	12.0%	5.0%
2024	19.5%	14.0%	5.5%
2025	22.0%	16.0%	6.0%

- The total ZEV % requirement is the % of the delivered fleet of vehicles each year that must be ZEV vehicles
- Manufacturers get a small number of credits for very clean conventional vehicles; the “Minimum ZEV floor” is the number of vehicles that must be ZEV vehicles (Battery electric), and the TZEVs are those that must be Plug-in Hybrid Electric Vehicles



Why it Works for Manufacturers

- Utilizes a web-based reporting platform (ZEV CRDTs system courtesy of California)
 - Both manufacturers and state administrators have accounts
- Manufacturers report credits from vehicles delivered for sale to a state
- State administrators review/approve and QA/QC credits
- Manufacturers may then use those credits to meet yearly obligations and bank excess credits for use in later years



Challenging Electrification Targets

Electrification of Passenger Vehicles	2030	2050
45% below 2001 levels by 2030		
# of ZEVs	500,000	2,610,000
% of Fleet	20%	95%
% of Sales	56%	100%

Heavy-duty Vehicle Electrification	2030	2050
Light Commercial Trucks and Transit Busses	30%	80%
School Busses & Refuse Trucks	30%	80%
Single Unit Short Haul Trucks	35%	80%

Passenger and Freight Rail Electrification	2030	2050
Passenger	45%	95%
Freight	45%	95%

ZEV Memorandum Of Understanding

- Signed by CT and 7 other states in 2013
- Established 2025 ZEV sales goals based on GHG reduction targets
- Some states viewing ZEV targets now through lens of better than expected range



California



New York



Oregon



Maryland



Massachusetts



Rhode Island

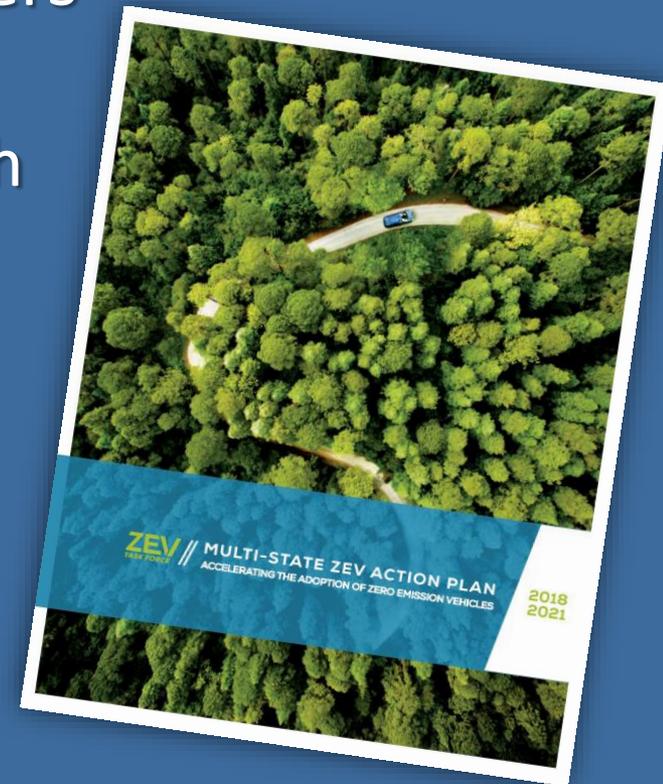


Vermont



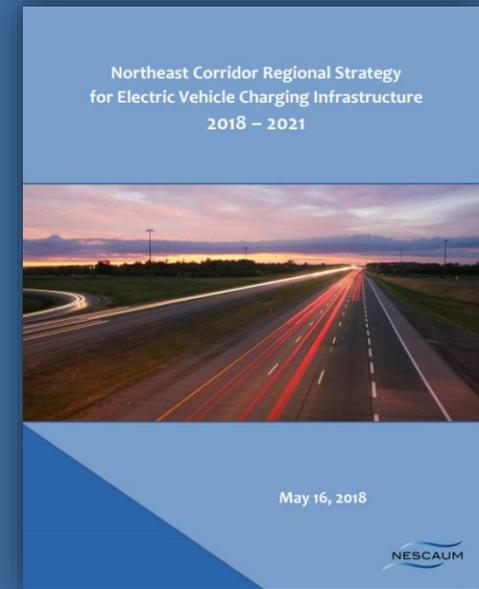
Multi-state ZEV Action Plan 2018 update

- New Jersey Joined the 8 other states in 2018
- New 2018-2021 plan presents five priority strategies and actions for states, OEMs, dealers and other key stakeholders
 - Consumer Education and Outreach
 - EV and H₂ Fueling Infrastructure
 - Consumer Purchase Incentives
 - Light Duty Fleets
 - Dealerships



NE Strategy for EV Charging Infrastructure

- Northeast corridor states from DC to Maine released 2018-2021 regional strategy on EV charging infrastructure
- Strategy addresses:
 - Overarching issues such as electricity rates, interoperability, signage, etc.
 - Specific roles and priorities for charging use cases such as charging at home, work, around town, etc.
 - Development of a branding initiative to promote the NE regional charging network and increase EV awareness



Drive Change. Drive Electric.



DRIVE CHANGE
DRIVE ELECTRIC

- Public-private partnership between auto mfrs. and Northeast states to advance consumer awareness, understanding, consideration and adoption of all EVs
- Media campaign showcases the convenience, affordability, technology, sustainability and power performance of EVs
- Encourages the public to test drive EVs through media and ride and drive events



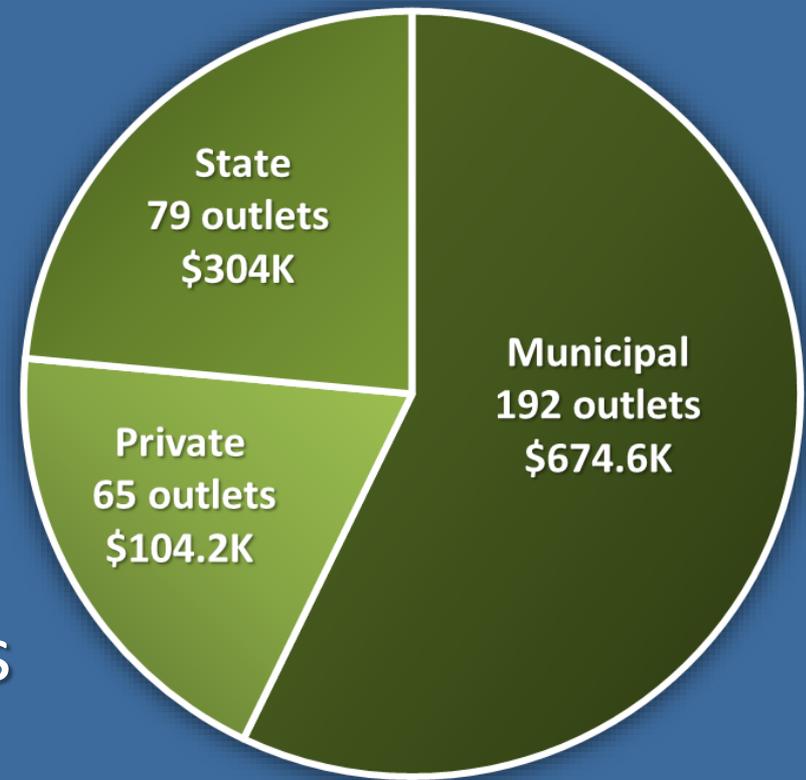
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EVConnecticut Charging Station Grants

- Focused on Municipal and Business locations
- Accessible to all Connecticut residents at no cost

2013-2017 Highlights:

- \$1.08 Million Allocated
- Over 200 Level 2 Chargers Installed
- 336 Charging Outlets/Plugs



CT's EV Charging Infrastructure

CT is Range Confident!

334 Open Public EV Charging Stations

782 Total EV Charging Plugs



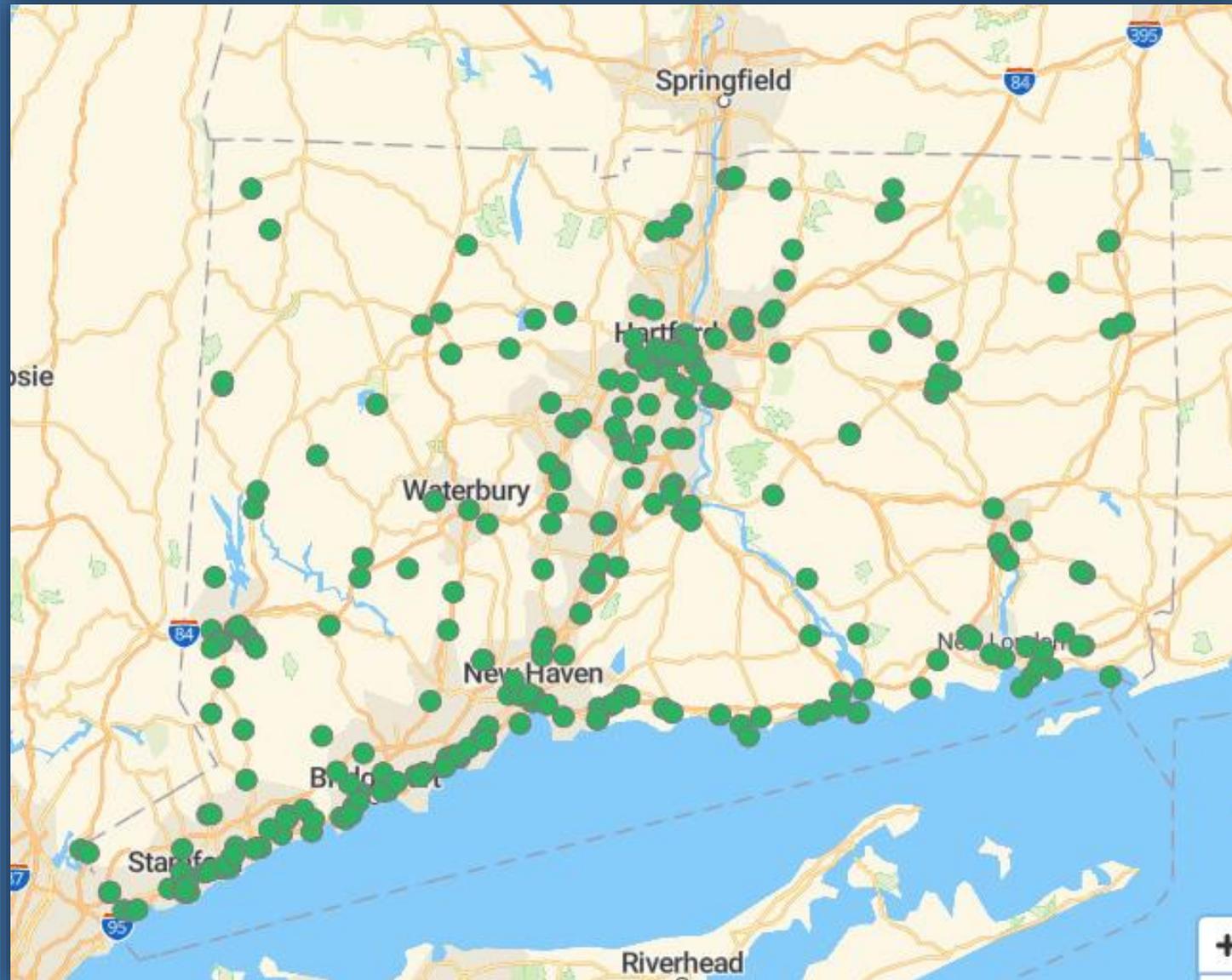
With more stations coming online everyday



CT public EV charging station data from US DOE *Alternative Fueling Station Locator*, February 5, 2019

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The Network is Growing!



CHEAPR Leading the Charge!



“Connecticut boasts what we believe is the most comprehensive EV consumer rebate program in the country.”

Gina Coplon-Newfield
Director of Sierra Club's Electric Vehicles Initiative

“First state in the country to offer rebates on advanced technology vehicles that are applied when the car is purchased.”



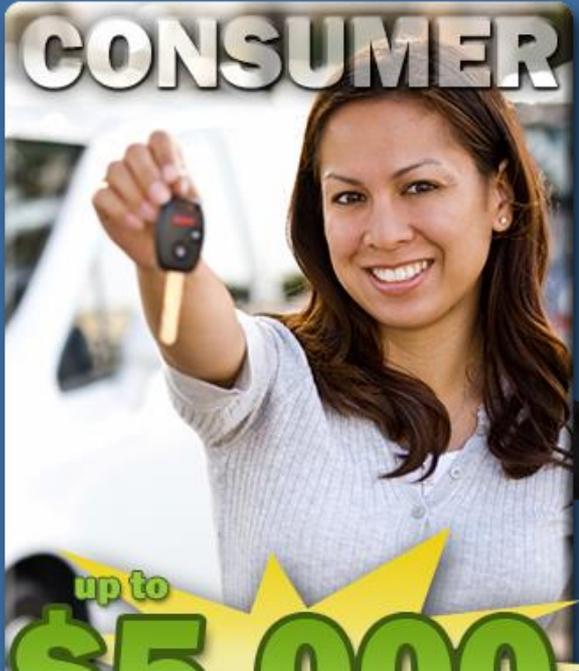
Sarah Shelton
hybridcars.com



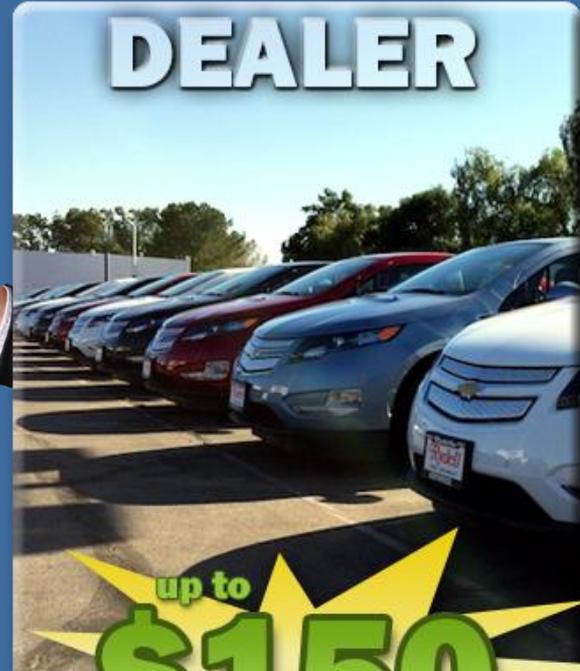
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CHEAPR Overview

CHEAPR provides the consumer with “money on the hood” and the dealer receives an incentive for selling an EV



up to
\$5,000



up to
\$150



CHEAPR Eligible Vehicles



BMW i3	27.6 kWh
Chevrolet Spark EV	16.2 kWh
FIAT 500e	17.6 kWh
Ford Focus Electric	24 kWh
Kia Soul EV	24.2 kWh
Mercedes Benz B-Class Electric	27.6 kWh
Mitsubishi i-MiEV	16.2 kWh
Nissan LEAF	24 kWh
smart ED	17.6 kWh
Volkswagen e-Golf	24.2 kWh

An Eligible Vehicle under CHEAPR...

...must be a **new** Battery Electric Vehicle (BEV), Plug-in Hybrid Electric Vehicle (PHEV) or Fuel Cell Electric Vehicle (FCEV)

...must have an MSRP **under \$50,000**

...must be **highway capable**

Not Eligible: Aftermarket EVs and conversions, scooters, ATVs, neighborhood vehicles, electric motorcycles



CHEAPR's Impact

CHEAPR has issued **4,230** EV rebates since May 2015 and **36%** of those have been full battery EVs

Best Selling BEVs



Tesla Model 3
570



Chevrolet Bolt
456



Nissan Leaf
311

Best Selling PHEVs



Chevrolet Volt
826



Toyota Prius Prime
687



Honda Clarity PHEV
372

Data as of January 15, 2019



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Rapid EV Growth in CT

Monthly EV Market share by Model

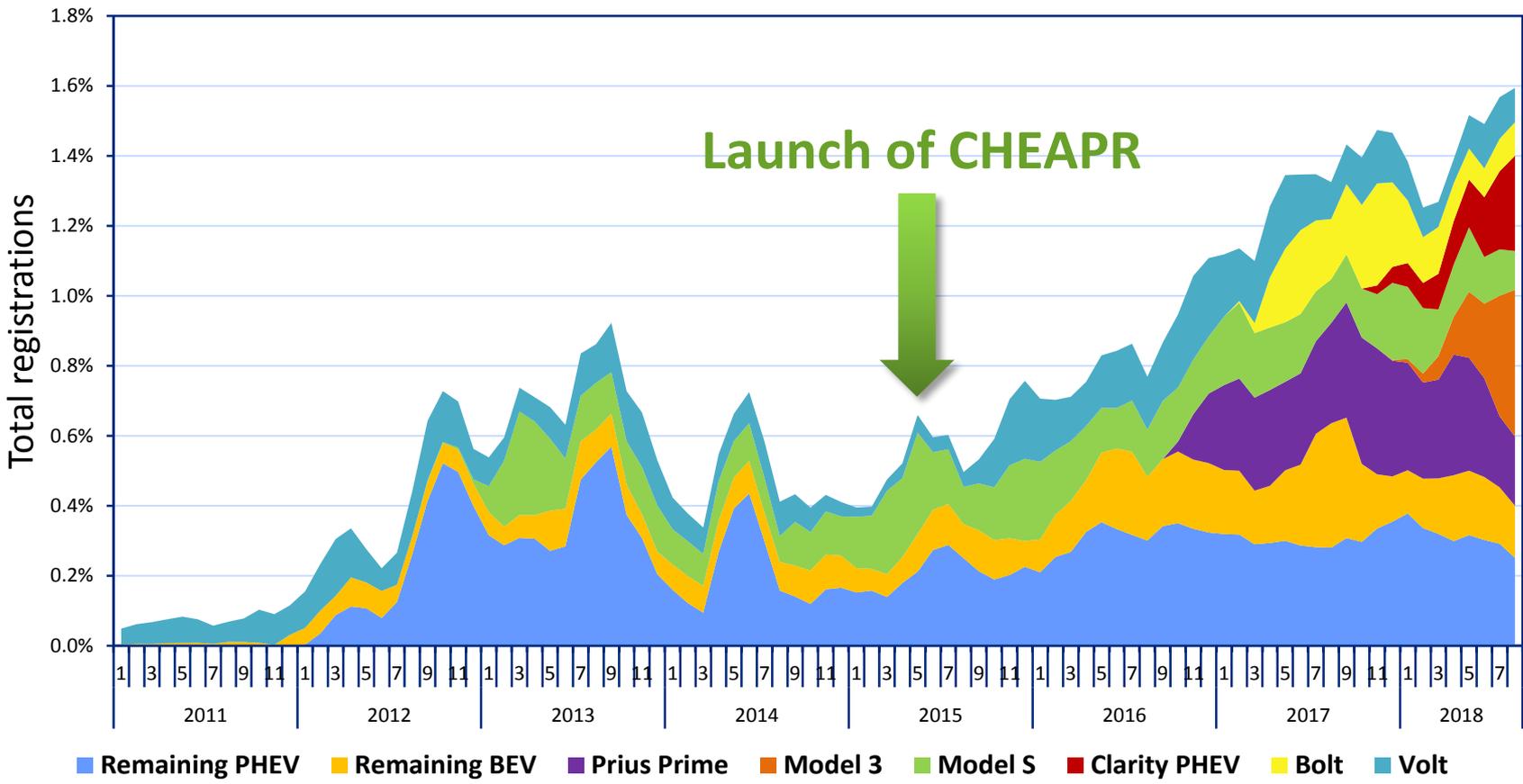


Chart based on IHS cumulative sales data through August 2018

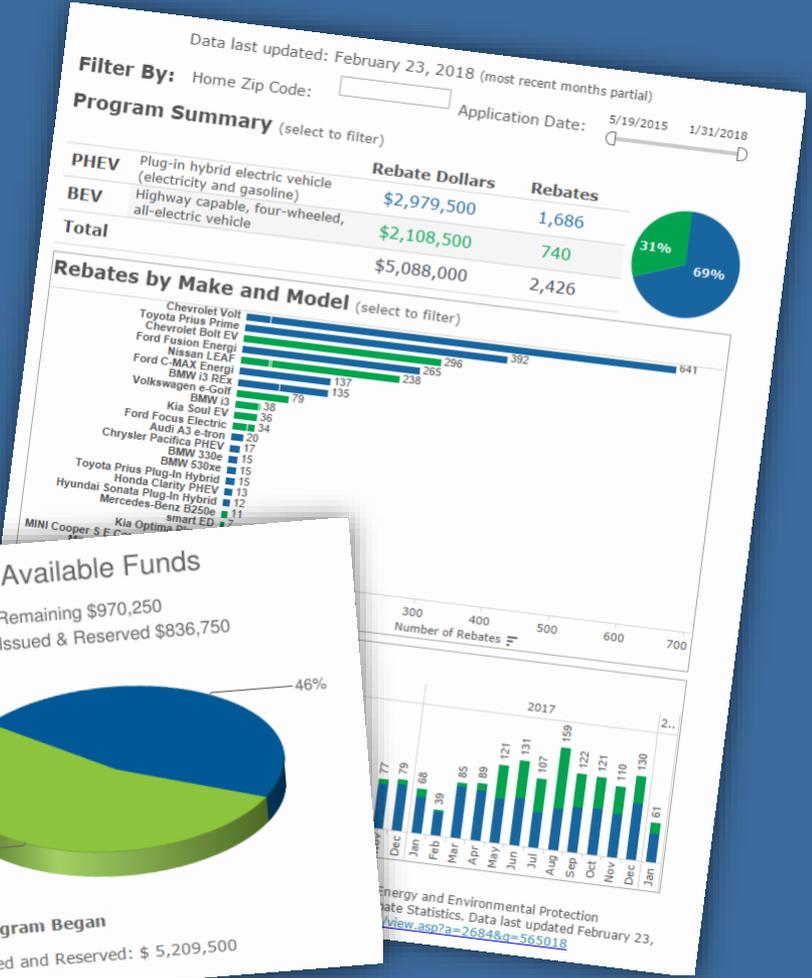


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CHEAPR Website

www.EVconnecticut.com

- Detailed interactive CHEAPR program statistics are updated monthly
- Dealer or consumer can check real-time available funding at any time on the CHEAPR website

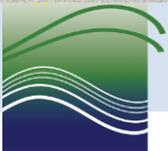


EV Ride & Drive Events

- Educates consumers about the benefits and cost of EVs
- Plug-in America and DEEP participated in 3 EV Ride & Drive events in 2018

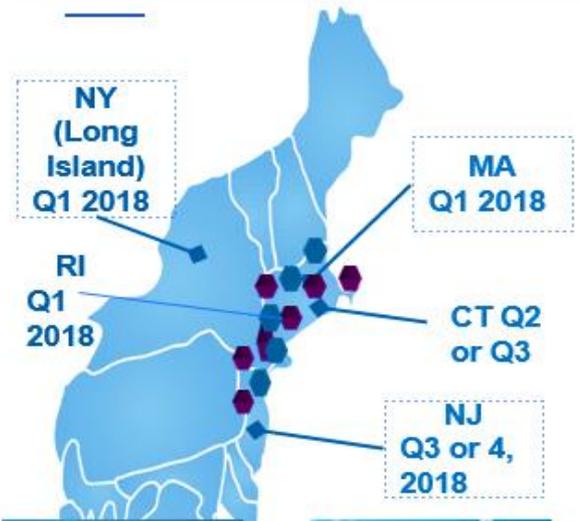


Surveys have shown that more than 85% of ride and drive participants left with a better opinion of EVs!



Northeast Retail H₂ Stations Network

H2 Stations Covering the Northeast



Network of 12 Stations

Start-up over Q4 2017-Q1 2018

Dedicated H₂ supply chain by



Project in collaboration with



New York

Bronx
Hempstead
Brooklyn
Site Location TBA



Connecticut

Hartford



Massachusetts

Braintree
Mansfield
Two others TBA



New Jersey

Lodi
Whippany



Rhode Island

Providence

Mar 2017

CaFCP Quarterly Update

Air Liquide, world leader in gases for industry, health and the environment



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Why Hydrogen?

- Conventional range and refueling times
- Zero tailpipe emissions
- Reduced GHGs compared to gas vehicles*
- Cold weather “penalty” on par with gasoline
- Viable for SUVs and AWD favored by CT’s drivers
- Economically viable
- As safe and easy to fuel as gasoline
- Potential for local H₂ and H₂ from renewables



* USDOE Fuel Cell Technology Office, *Fuel Cells for the Future*, July 17, 2015



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H₂ Fueling Station Program

DEEP continues to pursue the development of a retail hydrogen fueling station in the New Haven Area



Located within 8 miles of the I-91/I-95 interchange in New Haven



Compliance with SAE Standards for: Station Dispensing, Station to Car Communication, Nozzles, Fuel Quality



200 kg avg. daily capacity with the ability to handle back to back refills



Connecticut Department of Energy and Environmental Protection



VW ZEV Investment – “Electrify America”

- Appendix C of VW Settlement
- Electrify America is solely responsible for every aspect of selecting the national ZEV investments but is eager for success
- EA must spend **\$1.2 billion** outside CA and at least **\$300 million every 30 months**



VW Electrify America Cycle 1

- Cycle 1 National ZEV Investment Plan

- 30 Month Cycle (January 2017-June 2019)
- Multistate Network of **150- to 350-kW** DC Fast Chargers
- Installing **2,500 chargers** at 450 sites in 38 states

- Connecticut Focus

- Prioritization of charging on I-95, I-84, I-91

Now Open!

Stratford Square, Stratford, CT (8 outlets)

Waterford Commons, Waterford, CT (6 outlets)

Coming Soon!

Sam's Club, Wallingford, CT



VW Electrify America Cycle 2

- Cycle 2 National ZEV Investment Plan
 - Released February 4, 2019
 - 30 Month Cycle (July 2019-December 2021)
- Investments center on two core areas:
 - ZEV Fueling Infrastructure (\$235M)
 - Metro Community Charging, Highways and regional routes, Autonomous Vehicle Charging, and Renewable Generation
 - ZEV education, awareness and marketing (\$65M)



VW Electrify America Cycle 3

- Cycle 3: Proposals and feedback always accepted regardless of planning cycle – No deadline yet
- Project Specifications:
 - Shovel ready opportunities and sites
 - Projects that request large banks of chargers/location
 - Projects that generate large publicity opportunities
 - Unique brand neutral educational programs

Submit Proposals at
www.electrifyamerica.com



Connecticut Department of Energy and Environmental Protection

VW Settlement – “Appendix D”

- Connecticut’s allocation is about **\$55.7 Million**
- Disbursement over **10 year** schedule
- Connecticut Mitigation Plan approved in April 2018
- **\$12.2 Million** awarded during first round of diesel emissions reduction grants.
 - Includes funding for 12 fully electric transit buses (CT DOT) and two fully electric shuttle buses (UCONN).



VW Funding Allocations

At least...
70%

- On-Road Heavy Duty Vehicles
- Non-Road Equipment
- Commercial Marine Vessels
 - Locomotives
 - Diesel Emission Reduction Act (DERA) Option



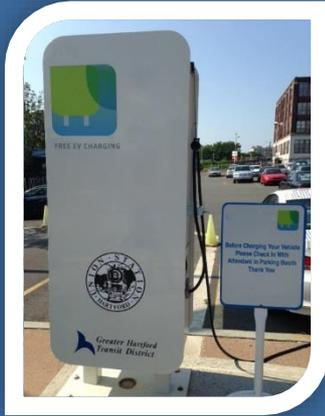
Up to...
15%
Zero Emission Vehicle Supply Equipment

Up to...
15%
Administrative Expenditures



Zero Emission Vehicle Supply Equipment

Eligible Equipment



Level 1, Level 2 or
Fast Charging
Equipment for
Electric Vehicles



Hydrogen (H₂)
Fuel Cell
Vehicle Supply
Equipment

Eligibility Criteria

EVSE: Must be located publicly, or at a workplace, or at a multi-unit dwelling

H2 Fueling Station: Must be publicly available and dispensing pressure of 70MPa



Connecticut Department of Energy and Environmental Protection

VW Grants Awarded

- First project solicitation period closed on July 31, 2018.
- DEEP received 56 applications requesting \$31.7 Million and awarded **\$12.2 Million to 10 projects**.
 - Awards include funding for **14 fully electric buses** - 12 transit buses for CT DOT and two shuttle buses for UCONN
 - Those awards also include funding for the associated charging infrastructure for the buses.
 - Also funded were 52 diesel school buses, 51 diesel commercial trucks, 17 CNG refuse trucks and a ferry repower.



Volkswagen Settlement Information

www.ct.gov/deep/vw

- Sign-Up for our VW Email Distro List to be notified of future funding opportunities
- Also in 2019 look for:
 - Second round of diesel emissions mitigation project solicitations
 - Additional outreach

VW Settlement Information

In late 2015, Volkswagen (VW) publicly admitted it had secretly and deliberately installed a defeat device - software designed to cheat emissions tests and deceive federal and state regulators - in nearly 500,000 VW and Audi branded 2.0-liter diesel vehicles and 83,000 3.0-liter diesel vehicles sold to American consumers.

Through a series of three partial settlements, EPA resolved their civil enforcement case against VW. As a result of these partial settlements, Connecticut is expected to receive over \$55 million for use towards offsetting the excess NOx emissions caused by VW's actions through extensive mitigation projects to reduce NOx from a wide array of mobile sources.

DEEP Announces Formal Comment Period on the Draft Final Mitigation Plan

Having proposed and taken public comment on an initial draft mitigation plan on January 18 - March 6, 2017, DEEP is now announcing a formal public comment period on the draft final mitigation plan. The actions outlined in the draft final mitigation plan are expected to significantly reduce mobile source related air emissions in Connecticut. PLEASE NOTE: This is not a formal solicitation for projects.

Formal Public Notice of Draft Final Mitigation Plan - February 15, 2018 (pdf)
Connecticut Draft Final Mitigation Plan - February 15, 2018 (pdf)

COMMENT PERIOD CLOSSES MARCH 9, 2018

How to comment: You may email written comments to deep.mobilesources@ct.gov, or send via postal mail to the Bureau of Air Management, Mobile Sources Division, Connecticut Department of Energy and Environmental Protection, 79 Elm Street, 5th Floor, Hartford, CT 06106 from February 15, 2018 to March 9, 2018. Please provide your full name, company name (if applicable), address, e-mail, and telephone number.

Join our E-mail List

Sign up to receive notifications of the outreach events, grant programs, mitigation plan development and future VW settlement information as soon as they become available.

Don't Miss Out!

Submit Comments

Do you have ideas for a diesel emissions mitigation project or other project eligible under the settlement that would utilize funds efficiently and reduce NOx emissions in CT? Submit your ideas to us!

Be Part of the Solution!

FAQ

Get quick answers to some commonly asked questions regarding the VW Settlement and the impact on Connecticut residents and our environment.

Get Quick Answers



Connecticut Department of Energy and Environmental Protection

Thank You!

Paul Farrell

Assistant Director

Air Planning & Standards

CT DEEP

79 Elm Street

Hartford, CT 06106



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Web: www.ct.gov/deep/air



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