



2017 NEW JERSEY SUSTAINABILITY SUMMIT



Welcome to Promoting a Clean Energy Future at the Local Level

WiFi network: [Guest-at-TCNJ3](#) | Username: [guest1783](#) | Password: [ujy6uvuh](#)





Speakers – Hopewell Valley Solar Challenge



Joann Held
Hopewell Green Team

Rex Parker
Hopewell Environmental Commission

Hopewell Valley Solar Challenge

Compare solar quotes online & get honest advice

Enter your zip code **Get Started**

or start with an **Instant Estimate** of your solar savings

We're helping you go solar with confidence!



This Solar Challenge is a unique partnership between the Hopewell Township Environmental Commission and Hopewell Valley Green Team, and Energy Sage and Sustainable Jersey. The project has been endorsed by the Hopewell Township Committee. We seek to promote a sustainable future and foster green alternatives for all of Hopewell Valley.

The Challenge is for homeowners and businesses to use this Energy Sage web portal to identify best options, obtain quotes, decide on a contract, and install a solar photovoltaic system.



Speakers -- EV



Ryan Gergely

*Research Scientist, Bureau of
Energy and Sustainability, NJ DEP*



Brittany Pfeiffer

*Environmental Specialist, Bureau
of Mobile Sources, Bureau of
Mobile Sources, NJ DEP*

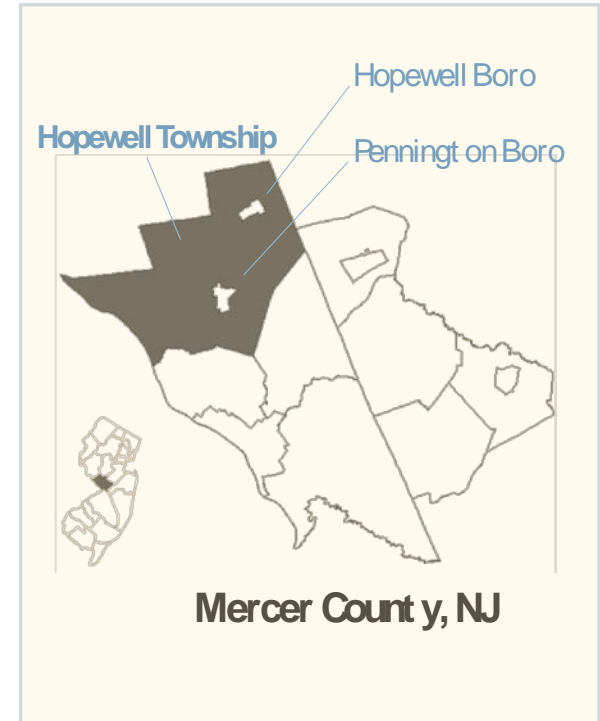


Chuck Feinberg

*Chairman, NJ Clean Cities Coalition
and Executive VP, Greener By
Design*

Hopewell Valley's Solar Challenge

- Hopewell Township - Pennington Borough partnership
- Green Team & EC long-standing interest in solar & sustainability ("EQ Challenge" 2008-11)
- Demographics, land/lot character, ordinances all support concept of more solar PV installs in the Valley
- Hopewell Valley appears to have significant untapped potential -- only needs a catalyst!



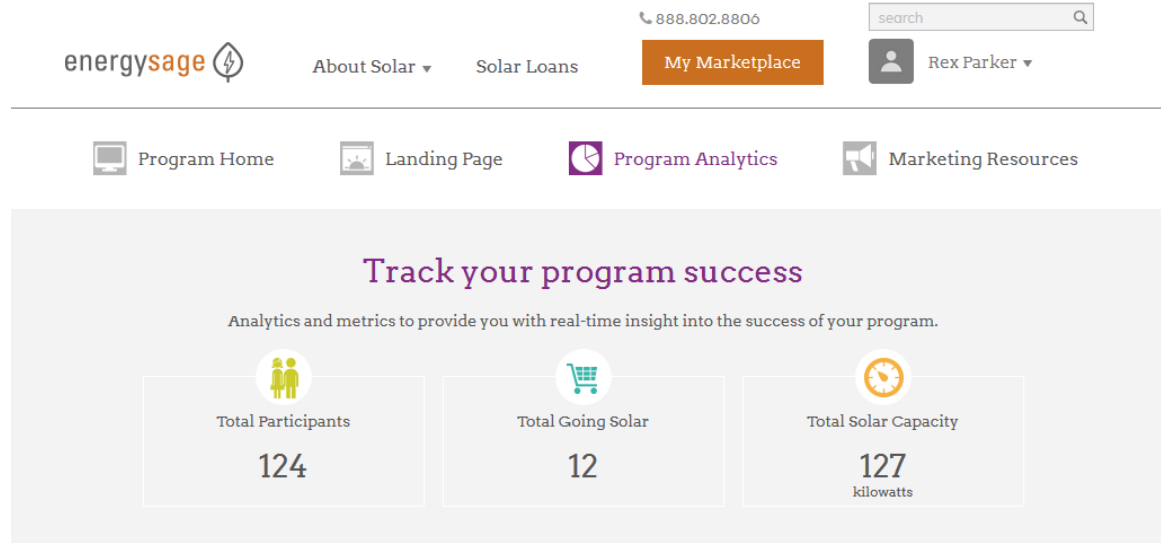
We're helping you go solar with confidence!



This Solar Challenge is a unique partnership between the Hopewell Township Environmental Commission and Hopewell Valley Green Team, and Energy Sage and Sustainable Jersey. The project has been endorsed by the Hopewell Township Committee. We seek to promote a sustainable future and foster green alternatives for all of Hopewell Valley.

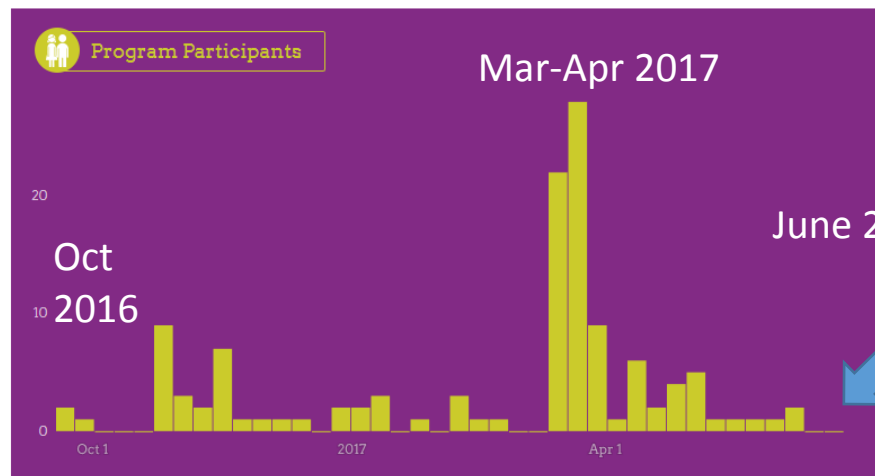
The Challenge is for homeowners and businesses to use this Energy Sage web portal to identify best options, obtain quotes, decide on a contract, and install a solar photovoltaic system.

Solar Hopewell Program Metrics



Updated
June 20
2017

Impact in your community



Future contracts anticipated – positive feedback loop...

Hopewell Solar Challenge: How We Did It

- Start up: identified team, created graphic & textual “PR”, and placed into circulation (roles of Green Team, Environmental Commission, and professional staff)
- Used several types of media
 - Paid advertisements + info article on local web-based news site -- MercerMe.com
 - Local print newspaper - Hopewell Valley News (Packet)
 - Physical banner
 - Township and borough websites
 - Green Team website and Facebook page
- Emphasized “no annoying phone calls, no unwanted solicitations”

Generate clean electricity
and reduce CO2 emissions



Help Hopewell Valley win
Sustainable Jersey's
Solar Challenge



20% savings!

Hopewell Solar Challenge
gets you best prices



Hopewell
Solar Challenge

Get Started
Now!
SolarHopewell.org

from the Hopewell Twp Environmental
Commission & Hopewell Valley Green Team,
partners with Sustainable Jersey & EnergySage

MercerMe Community Connected

TOWN NEWS ▾ LIFESTYLE ▾ ABOUT US FOLLOW US ▾ CALENDAR ▾ LETTERS TO THE EDITOR 🔍

TRENDING NOW Further Signs of a Fractured Relationship Between

Featured

As heating season begins, know the dangers of carbon monoxide
MercerMe - Nov 1, 2016

1,115 Followers FOLLOW

3,259 Fans LIKE

OPEN STUDIO FOR ALL AGES
The Painter's LOFT ART STUDIO
Walk Ins Welcome!
1 Tree Farm Rd Pennington

Generate clean electricity and reduce CO2 emissions
Help Hopewell Valley win Sustainable Jersey's Solar Challenge

20% savings!
Hopewell Solar Challenge gets you best prices

Hopewell Solar Challenge
Get Started Now!
SolarHopewell.org

from the Hopewell Twp Environmental Commission & Hopewell Valley Green Team, partners with Sustainable Jersey & EnergySage



SolarHopewell.org

Join the Hopewell
Solar Challenge!

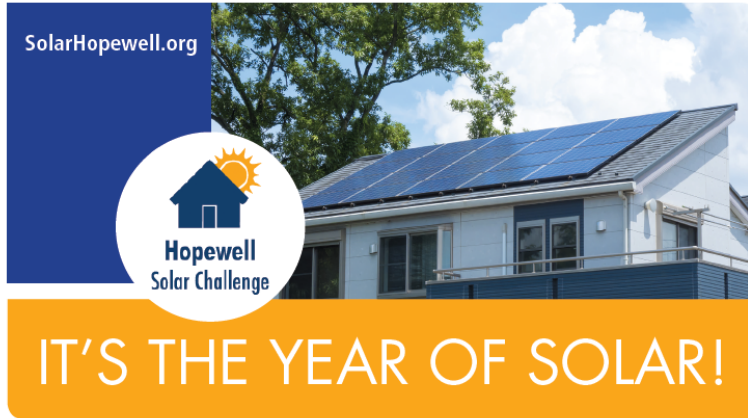
Solar is easy, affordable and accessible
for all property types.
Take action to reduce CO2 emissions.



Hopewell Solar Challenge: Most Effective Media

- E-mailed announcement and details to an extensive residents address list curated by the Township
- Made oral announcements at township committee and planning board public meetings
- Met with local community business groups
- Placed information in HoVal Schools virtual backpack
- Info & graphic on the innovative new municipal interactive website “Have Your Say Hopewell Township”

Postal mailer sent by Township to ~6000 residences in March -- custom 2-sided flyer



Hopewell Valley Solar Challenge Begins Urgent Campaign for Local Solar Power Installations

Join the Hopewell Valley Solar Challenge to save money, generate your own "green" electricity, and help our town win a \$10,000 prize from Sustainable Jersey! All you need to do is go to SolarHopewell.org on the internet to receive specifics on the most appropriate system design and scale for your place and estimates for the best possible price. No annoying phone calls and unsolicited proposals.

ABOUT THE PROGRAM

The Solar Challenge is a unique partnership between the Hopewell Township Environmental Commission and Hopewell Valley Green Team, together with Energy Sage and Sustainable Jersey. Endorsed by resolutions of the Hopewell Township Committee and Pennington Borough, the project aims to facilitate solar photovoltaic power installation across Hopewell Township and Pennington Borough.

BENEFITS OF PARTICIPATING IN THE SOLAR CHALLENGE:

- swiftly identify the best system for your unique situation
- access free on-line resources and fully vetted installers
- save thousands of dollars through lowest prices
- make money through NJ solar renewable energy credits (SRECs)
- generate your own solar electricity, offsetting CO2 emissions
- help us win the \$10,000 prize for a more sustainable Hopewell Valley

continued on back >



The Challenge is a competition among 7 selected New Jersey towns seeking the greatest number of new solar installations per capita by May 31, 2017. The winning town will receive a \$10,000 prize from Sustainable Jersey to be used for a "green" project. Sustainable Jersey is an innovative nonprofit organization that provides tools, training, and financial incentives to communities pursuing sustainability programs such as cutting greenhouse gas emissions and other community-wide efforts.

EnergySage is the only independent comparison-shopping website for solar energy systems and financing options in the country. The EnergySage portal accessed through SolarHopewell.org provides concise information about financial options including purchase and lease comparisons, solar technologies and materials, specifications for your situation, and projected future savings. The online marketplace provides direct contact with a growing list of pre-screened and validated solar installers. By fostering competitive bidding the process leads to the most appropriate system design and scale and leads to the best possible price quotes.

There is no time like now to go solar! Take charge of your energy future, address some of the major issues of our times, and help Hopewell Valley win the Sustainable Jersey Solar Challenge. Go to SolarHopewell.org through your web-browser and get into the Challenge!

Contact information:
solarhopewell@gmail.com



Track your program success

Analytics and metrics to provide you with real-time insight into the success of your program.



Total Participants

124



Total Going Solar

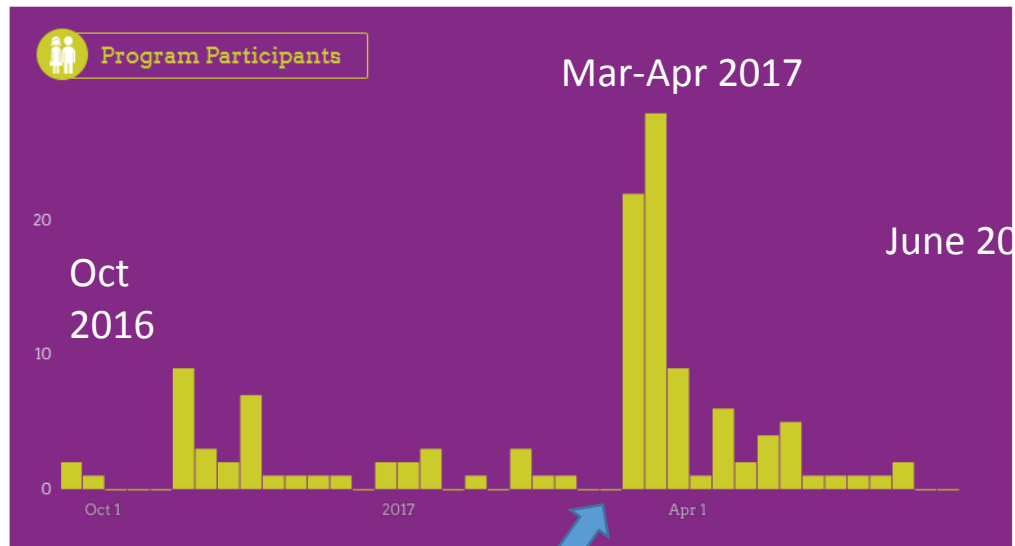
12



Total Solar Capacity

127
kilowatts

Impact in your community



Flyer mailed to 6000 residences mid-March

A version of the flyer was published in the annual township calendar mailed to residents



Hopewell Valley Solar Challenge Begins Urgent Campaign for Local Solar Power Installations

Join the Hopewell Valley Solar Challenge to save money, generate your own "green" electricity, and help our town win a \$10,000 prize from Sustainable Jersey! All you need to do is go to **SolarHopewell.org** on the internet to receive specifics on the most appropriate system design and scale for your place and estimates for the best price. No annoying phone calls or unsolicited proposals.

ABOUT THE PROGRAM

The Solar Challenge is a unique partnership between the Hopewell Township Environmental Commission and Hopewell Valley Green Team, together with Energy Sage and Sustainable Jersey. Endorsed by resolutions of the Hopewell Township Committee and Pennington Borough, the project aims to facilitate solar PV power installation across Hopewell Township and Pennington Borough.

BENEFITS OF PARTICIPATING IN THE SOLAR CHALLENGE:

- *swiftly identify the best system for your unique situation*
- *access free on-line resources and fully vetted installers*
- *save thousands of dollars through lowest prices*
- *make money through NJ solar renewable energy credits (SRECs)*
- *generate your own solar electricity, offsetting CO2 emissions*
- *help us win the \$10,000 prize for a more sustainable Hopewell Valley*

Contact: solarhopewell@gmail.com

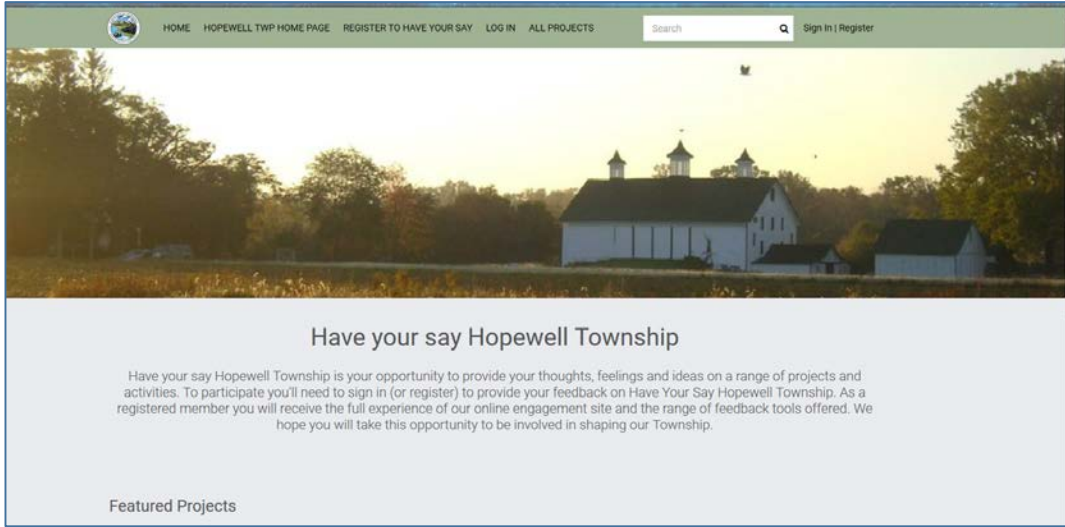
The Challenge is a competition among 7 selected New Jersey towns seeking the greatest number of new solar installations per capita by May 31, 2017. The winning town will receive a \$10,000 prize from Sustainable Jersey to be used for a "green" project. Sustainable Jersey is an innovative nonprofit organization that provides tools, training, and financial incentives to communities pursuing sustainability programs such as cutting greenhouse gas emissions and other community-wide efforts.

EnergySage is the only independent comparison-shopping website for solar energy systems and financing options in the country. The EnergySage portal accessed through SolarHopewell.org provides concise information about financial options including purchase and lease comparisons, solar technologies and materials, specifications for your situation, and projected future savings. The online marketplace provides direct contact with a growing list of pre-screened and validated solar installers. By fostering competitive bidding the process leads to the most appropriate system design and scale and leads to the best possible price quotes.

Take charge of your energy future, address some of the major issues of our times, and help Hopewell Valley win the Sustainable Jersey Solar Challenge. Go to SolarHopewell.org in your web-browser today!

Have Your Say Hopewell Township

- **Utilized the recent roll-out of a novel interactive website, “Have Your Say Hopewell Township”**
- Site facilitates info and feedback among residents, municipal staff, and elected & appointed officials
- First of its kind among NJ municipalities, and one of very few in entire country
- URL: <http://www.haveyoursayhopewelltp.org/>
- **Site traffic strong, e.g., May 2017 → 880 hits**



SolarHopewell on the "Have Your Say" Website



Home > Help us win our solar challenge

Help us win our solar challenge



A way to do something to help!

You may have heard a lot of buzz about solar energy but have unanswered questions - solar can seem complicated. The Hopewell Solar Challenge was developed to help answer your questions about solar and make it simple and easy to get a great deal on a solar energy system of your own.

The Hopewell Solar Challenge is a town-sponsored program that has partnered with EnergySage, an online solar marketplace that was developed with funding and support from the US Dept of Energy. This free service will help you learn about and shop for a solar energy system with no obligation to

make a purchase in the end. To participate, simply visit our website by clicking [HERE](#).

The great news is over 50,000 New Jersey homeowners have gone solar and are saving money and the environment already. An average NJ homeowner saves enough money each year from reduced electricity bills and other incentives to pay back their initial investment in ~7 years. And, you can go solar with no money down through various loan and leasing programs.

Sign up today for some free solar quotes and help us spread the word about the Hopewell Solar Challenge.

Take charge of your energy future, address some of the major issues of our times, and help Hopewell Valley win the Sustainable Jersey Solar Challenge.

STORIES

FAQ

What is the Hopewell Valley Solar Challenge?

Why should I join the Hopewell Valley Solar Challenge?

Who are the partners in the Hopewell Valley Solar Challenge?

What are the benefits of participating in the Solar Challenge?

What is Sustainable Jersey?

What is EnergySage?

more...

A Way to Do Something to Help!

You may have heard a lot of buzz about solar energy but have unanswered questions - solar can seem complicated. The Hopewell Solar Challenge was developed to help answer your questions about solar and make it simple and easy to get a great deal on a solar energy system of your own.

The Hopewell Solar Challenge is a town-sponsored program that has partnered with EnergySage, an online solar marketplace that was developed with funding and support from the US Dept of Energy. This free service will help you learn about and shop for a solar energy system with no obligation to make a purchase in the end. To participate, simply visit our website www.SolarHopewell.org

The great news is over 50,000 New Jersey homeowners have gone solar and are saving money and the environment already. An average NJ homeowner saves enough money each year from reduced electricity bills and other incentives to pay back their initial investment in ~7 years. And, you can go solar with no money down through various loan and leasing programs.

Sign up today for some free solar quotes and help us spread the word about the Hopewell Solar Challenge. www.SolarHopewell.org

Email the Hopewell Valley Green Team: solarhopewell@gmail.com

Final Surge:

Face to Face, PC to PC

- Green Team info booths at Mercer Greenfest March 18 and Pennington Day May 20
- For April 22 Earth Day weekend, a solar mini-tour of local home installations was provided for active participants
- Finally, we sent one last e-mail message urging the active-but-undecided's to contract by end of May if they were still considering solar

Lessons Learned

- Significant number of new solar contracts achieved -- would not have been realized without this program.
- Biggest difficulty -- differentiating Energy Sage from bkgd. “noise” of vendors, advertisements, cold calls.
- Suggest more attention to list of vetted installers for given area (some went with non-listed vendors).
- Main conclusion: there appears to be significant untapped potential for more solar PV installations locally and likely across NJ and other states.
- We thank SJ & Energy Sage for sponsoring the Challenge!



Electric Vehicles, Clean Air and Your Community

2017 New Jersey Sustainability Summit
June 21, 2017



New Jersey Department of Environmental Protection
Division of Air Quality, Energy and Sustainability








PROTERRA

PROTERRA CATALYST

BATTERY ELECTRIC

ZERO TAILPIPE EMISSIONS

Photo from Proterra.com



Photo from Workhorse



Photo from Zeromotorcycles



Photo from Stevenson Crane Service



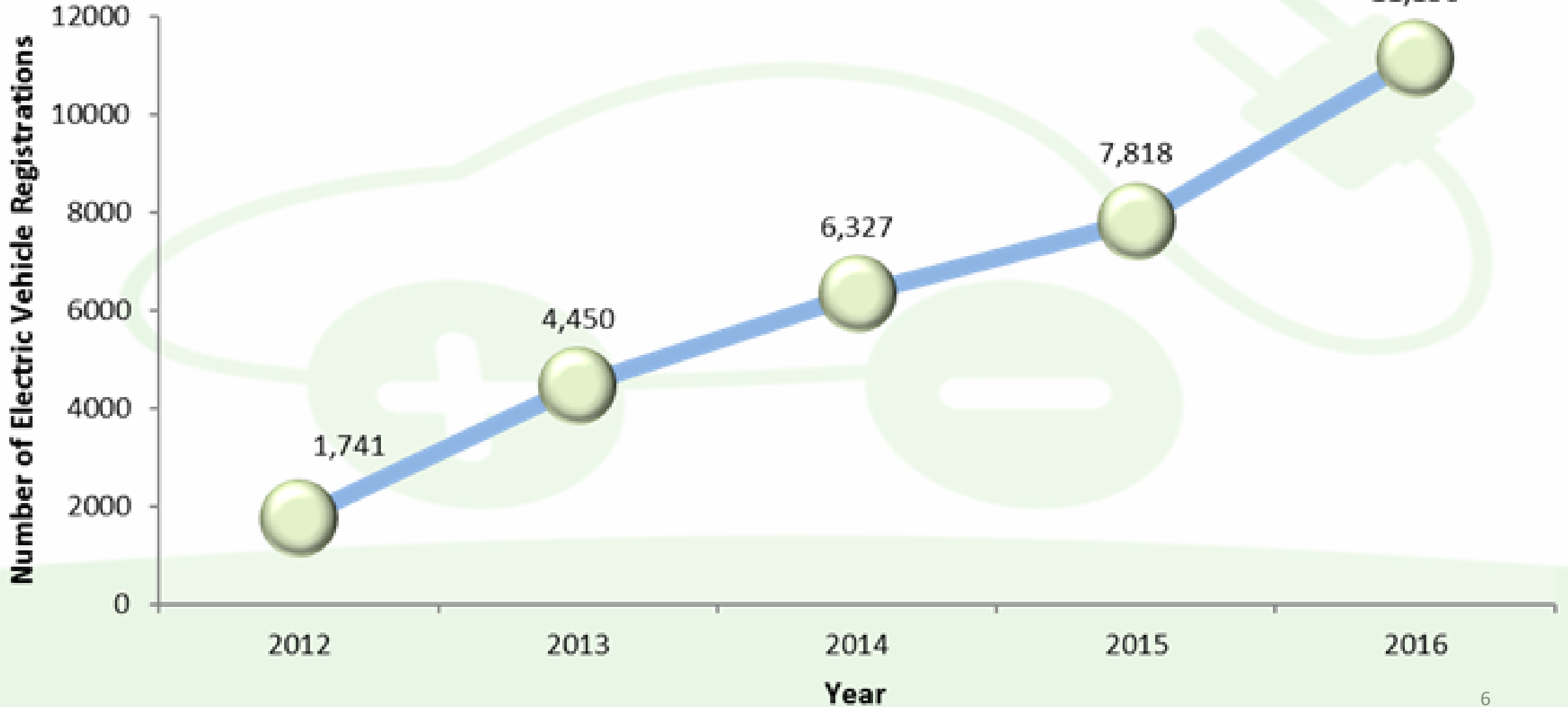
Photo from Workhorse



Photo from Tesla Motors

600,000 Americans have made the switch to electric.

Electric Vehicle Registrations in New Jersey 2012 - 2016



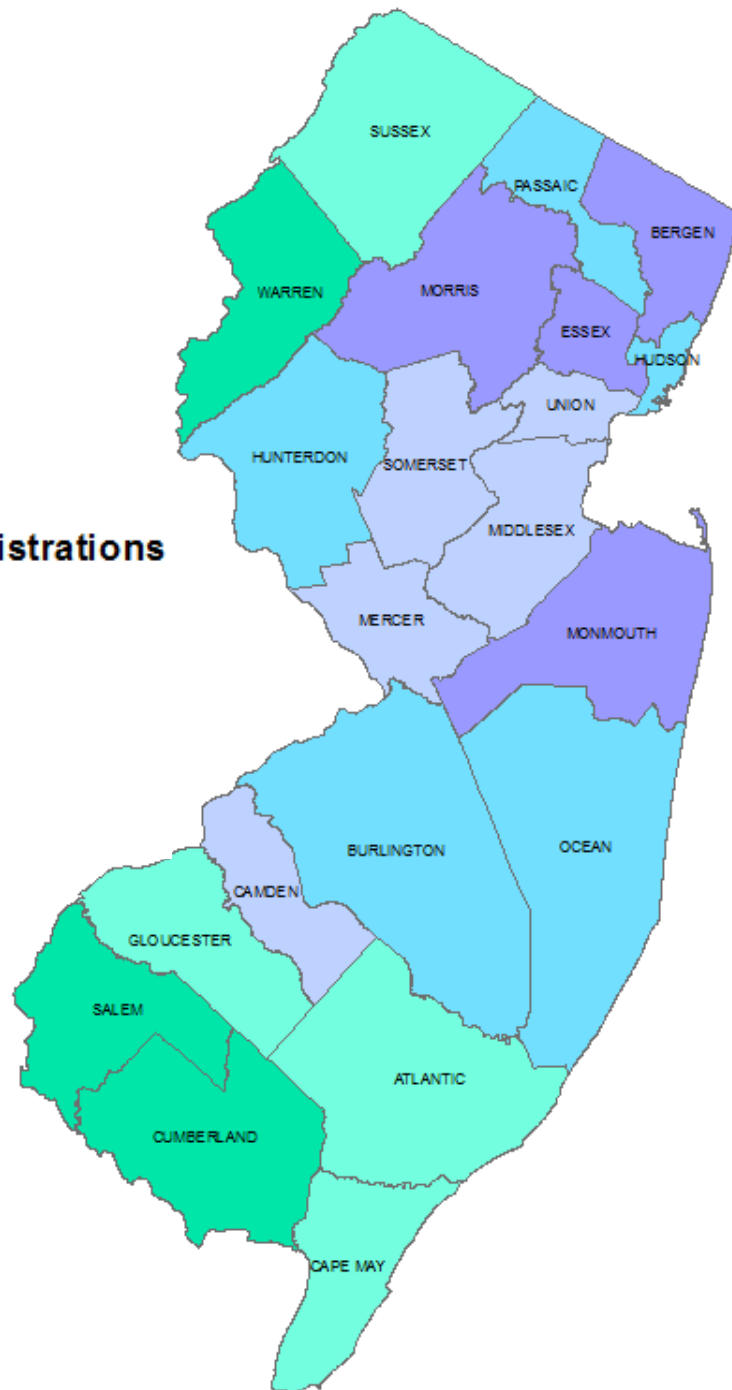
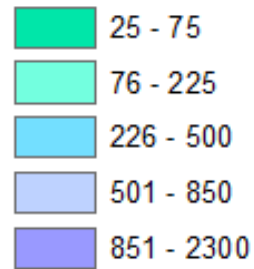
NJ Electric Vehicle Registrations by County

Includes:

- Battery Electric Vehicles
- Plug-In Hybrid Electric Vehicles
- Neighborhood Electric Vehicles

Legend

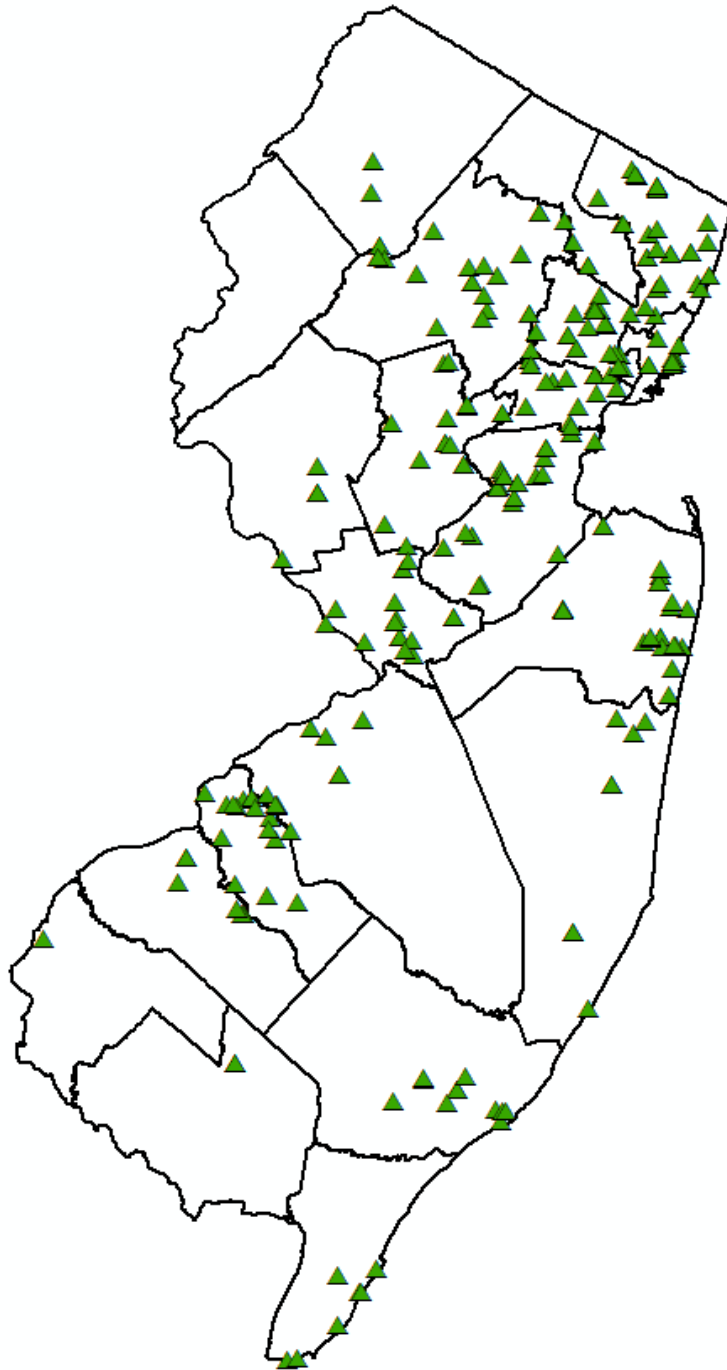
EV/PHEV Registrations



The Charging Network is Growing

Publicly accessible EV
charging stations:

486 charge points at
211 locations



Source: www.afdc.energy.gov (6/2017)

Local, Regional and National Efforts

- Northeast States for Coordinated Air Use Management (NESCAUM)
- Transportation and Climate Initiative – Northeast Electric Vehicle Network
- California Air Resources Board
- New Jersey Clean Cities Coalition
- North Jersey Transportation Planning Authority
- ChargEVC – The Electric Vehicle Coalition of NJ
- **Sustainable Jersey**

Incentives!

- ✓ Federal Tax Credit for vehicles - up to \$7,500*
- ✓ State Zero Emission Vehicle Sales Tax Exemption*
- ✓ Toll Discounts (Garden State Parkway, NJ Turnpike)
- ✓ Utility and Automaker Incentive Programs
- ✓ High Occupancy Lane Access (hybrids only)
- ✓ Streamlined Permitting for Home Charging Stations
- ✓ It Pay\$ to Plug in – NJ Workplace Charging Grant
- ✓ NJ Recognition Program for Workplace Charging
- ✓ See <http://www.drivegreen.nj.gov/affordable.html>

* Not available to public entities

Why do we care?



Vehicles cause air pollution.

Photo from Getty Images

Ozone (Smog) Health Effects

**Healthy
airway**



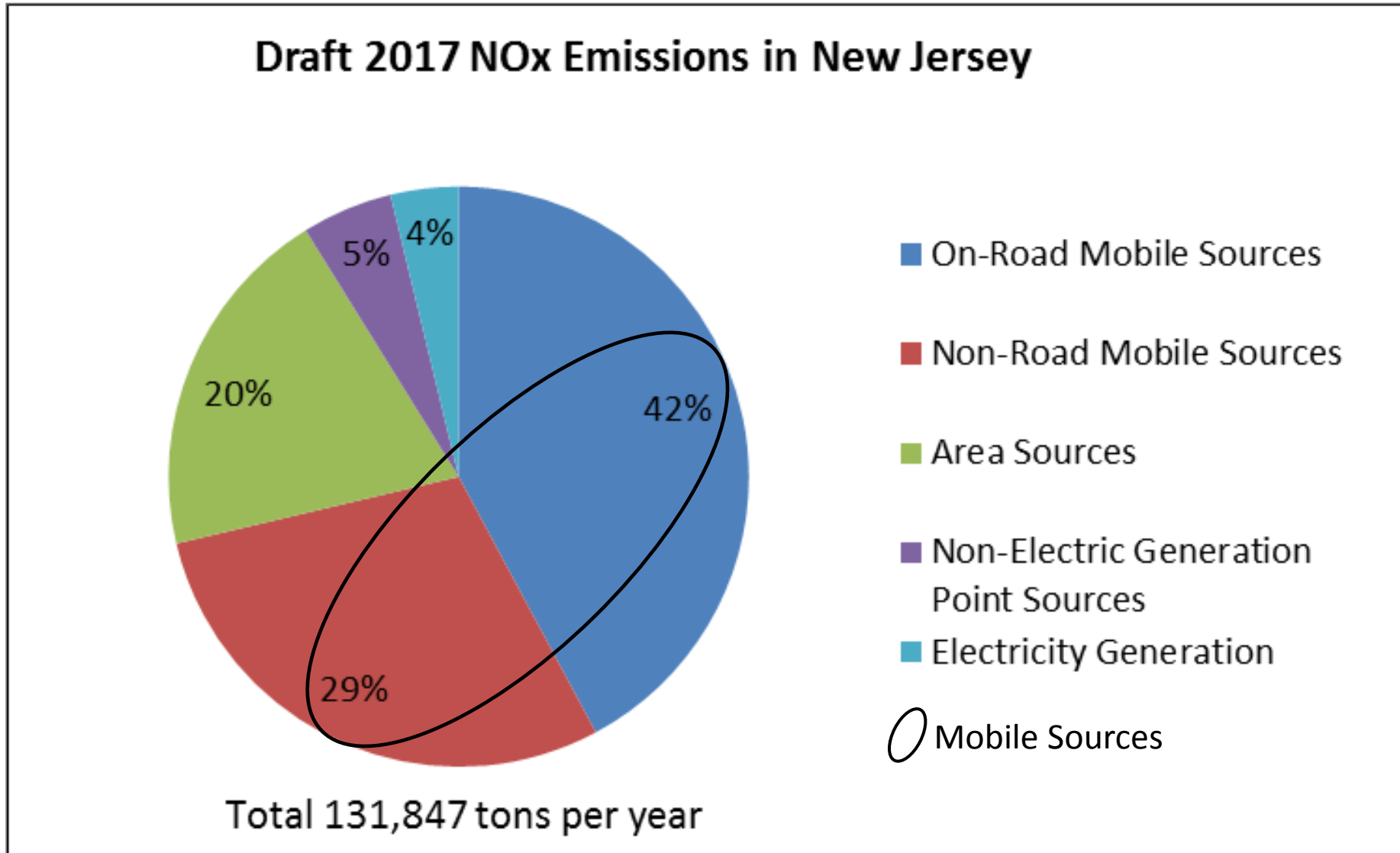
**Inflamed
airway due
to ozone
inhalation**



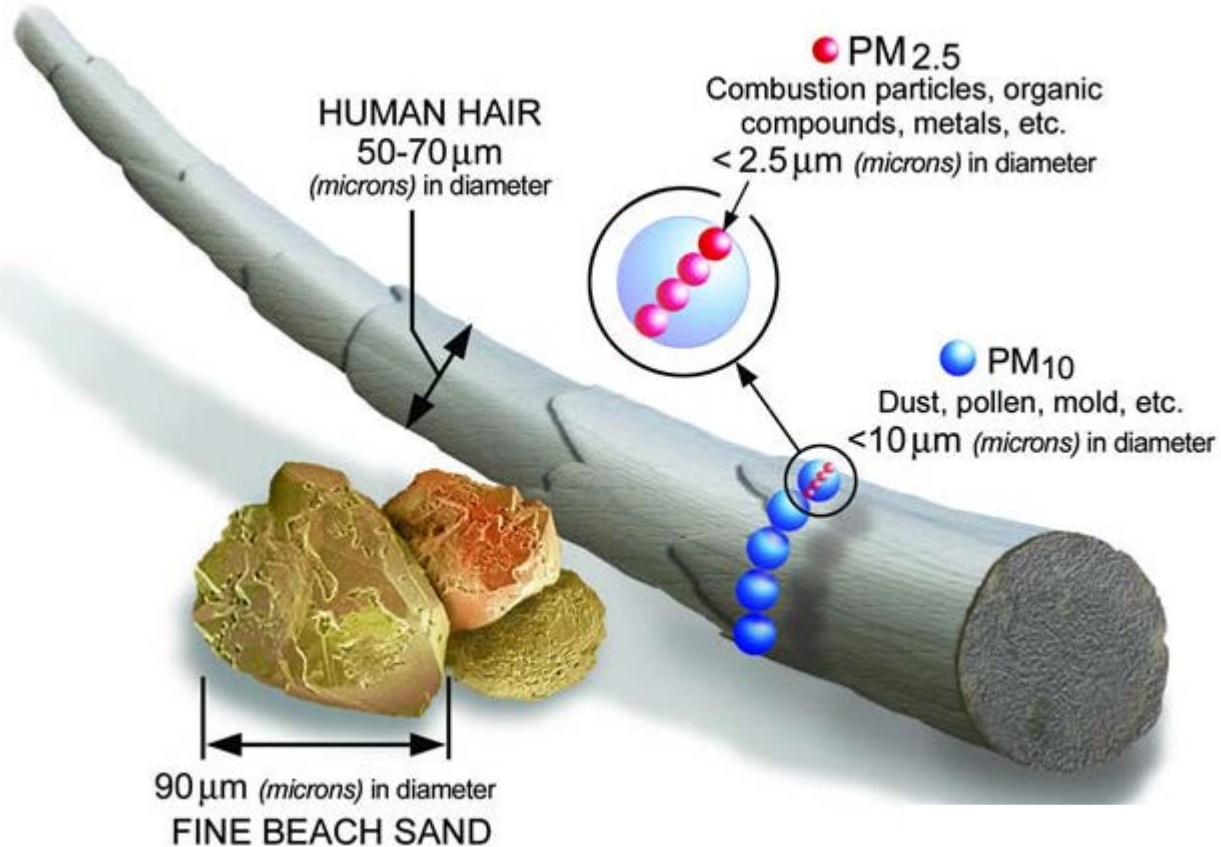
Ozone Health Effects

- Decreases lung function
- Coughing and chest pain
- Increases susceptibility to respiratory infections
- Permanent damage to lungs
- Promotes allergic reactions
- Death

Vehicles Contribute to Ozone Pollution



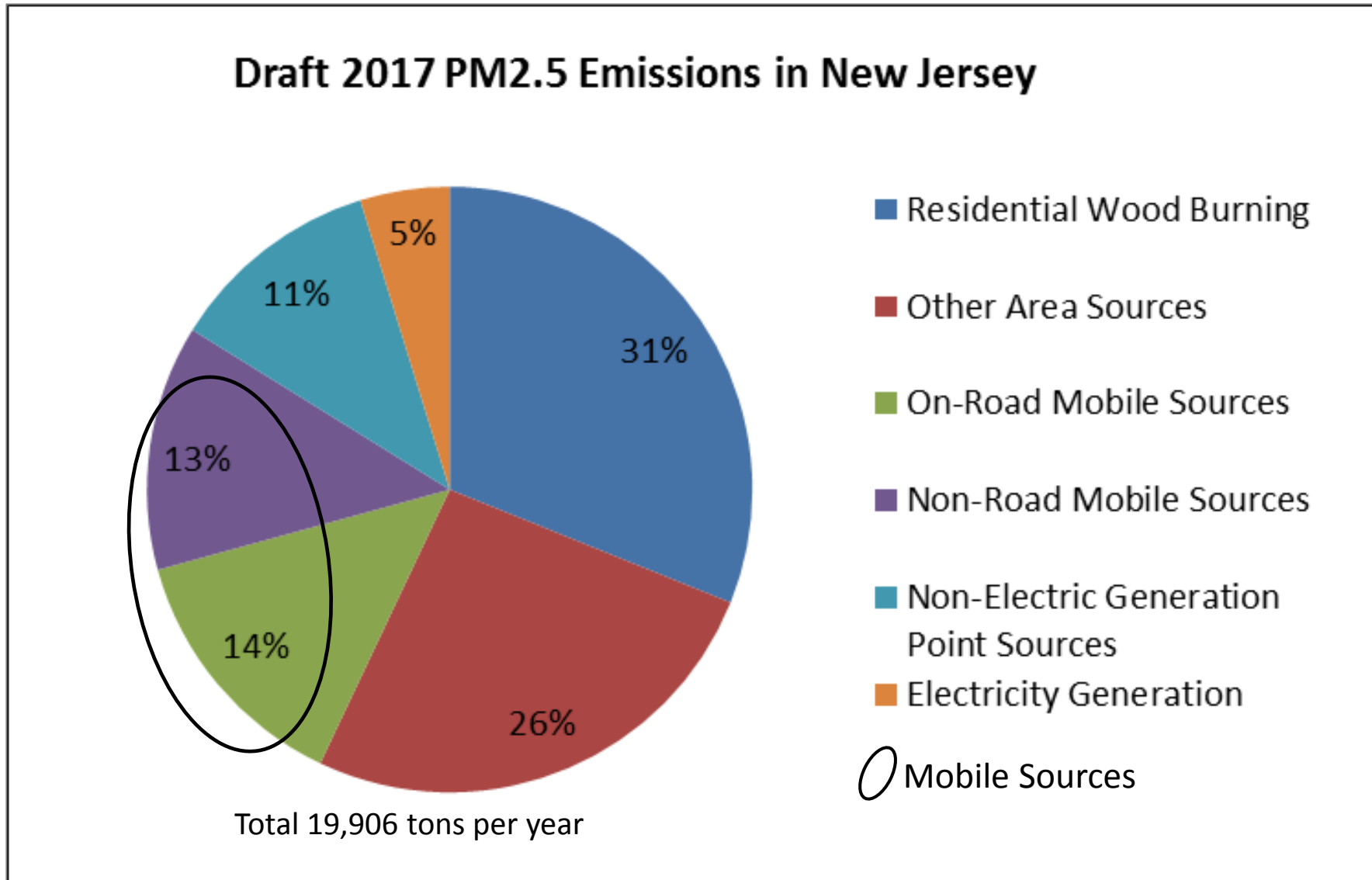
Fine Particle (PM2.5) Health Effects



PM 2.5 Health Effects

- Premature death
- Respiratory-related hospital admissions and ER visits
- Aggravated asthma
- Coughing, difficulty/pain breathing
- Chronic bronchitis
- Decreased lung function
- Diesel carcinogen
- Work and school absences

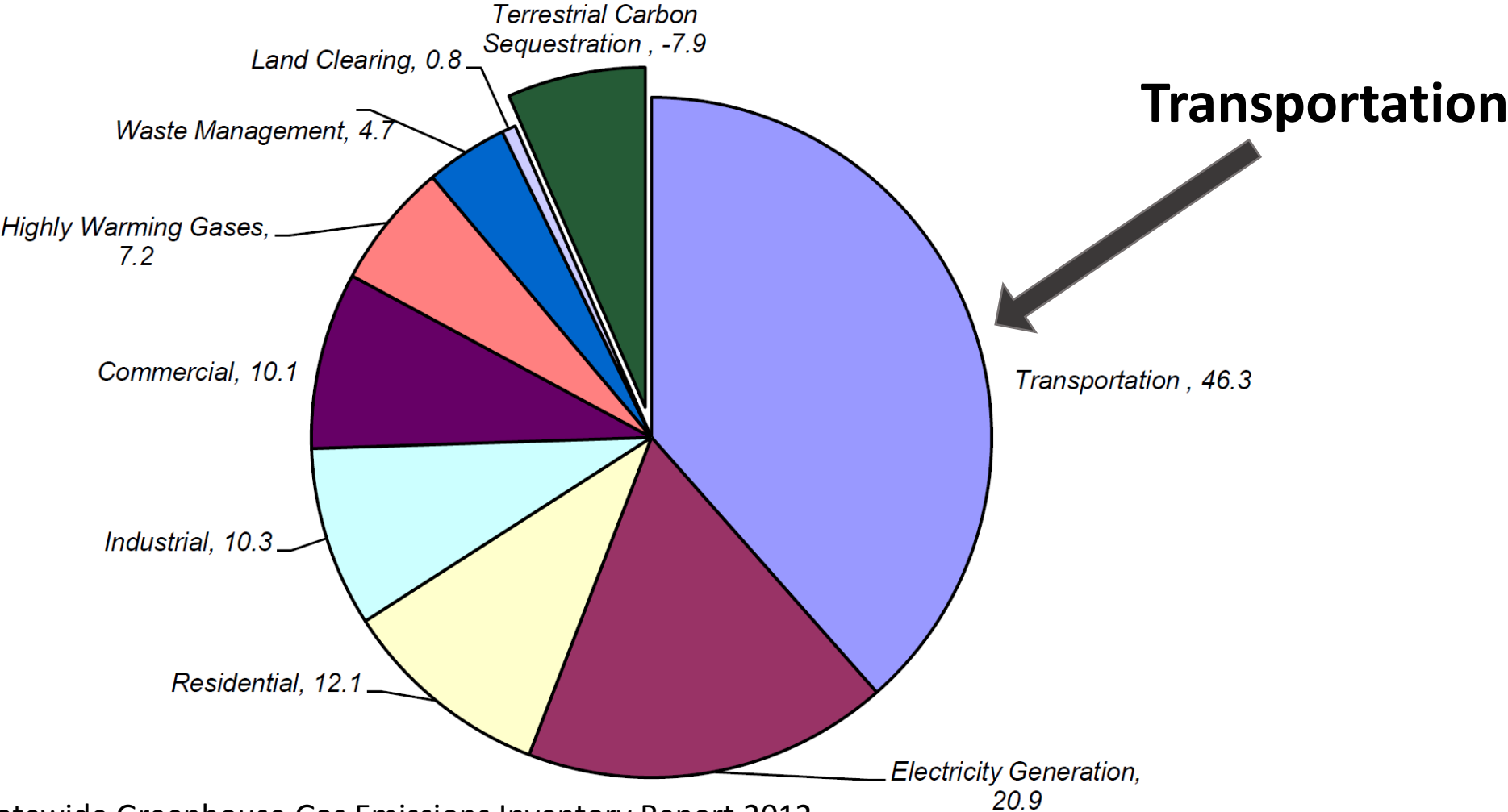
Vehicles Cause Particulate Pollution



Source: Draft MARAMA 2017 BETA2 Regional Modeling Inventory

Vehicles Cause Greenhouse Gas Pollution

Estimated NJ Statewide Greenhouse Gas Emissions, 2012
(in million metric tons CO₂ equivalent, MMTCO₂e)
Total net emission 104.6 MMTCO₂e



Source: New Jersey Statewide Greenhouse Gas Emissions Inventory Report 2012

Electric Vehicles Improve Air Quality

- Less ozone-causing chemicals
- Less harmful particulates
- Less greenhouse gases

Electric Vehicles Improve Air Quality

- Less ozone-causing chemicals
- Less harmful particulates
- Less greenhouse gases

Electric vehicles get cleaner over time.

What Can I Do?



- Consider an EV for your next family vehicle.
- Electrify your fleet
- Install charging stations
- Host a Ride & Drive at your next event
- Spread the word
- **Complete Sustainable Jersey actions!**

Sustainable Jersey Actions and Guidance

Make Your Town Electric Vehicle Friendly

Public Electric Vehicle Charging Infrastructure

Purchase Alternative Fuel Vehicles



Meet Target for Green Fleets

Guidance for Creating Plug-In Electric Vehicle (PEV) Friendly Ordinances

<http://www.sustainablejersey.com/>

Electric Vehicles 101

Electric vehicles run partially or completely on electricity.

- Battery Electric Vehicle
- Plug-in Hybrid Electric Vehicle
- Hydrogen Fuel Cell Electric Vehicle
- Neighborhood Electric Vehicle



Photo from Thinkstock

Electric Vehicles....

Myths versus Truths

MYTH: We're Replacing Tailpipes with Smokestacks



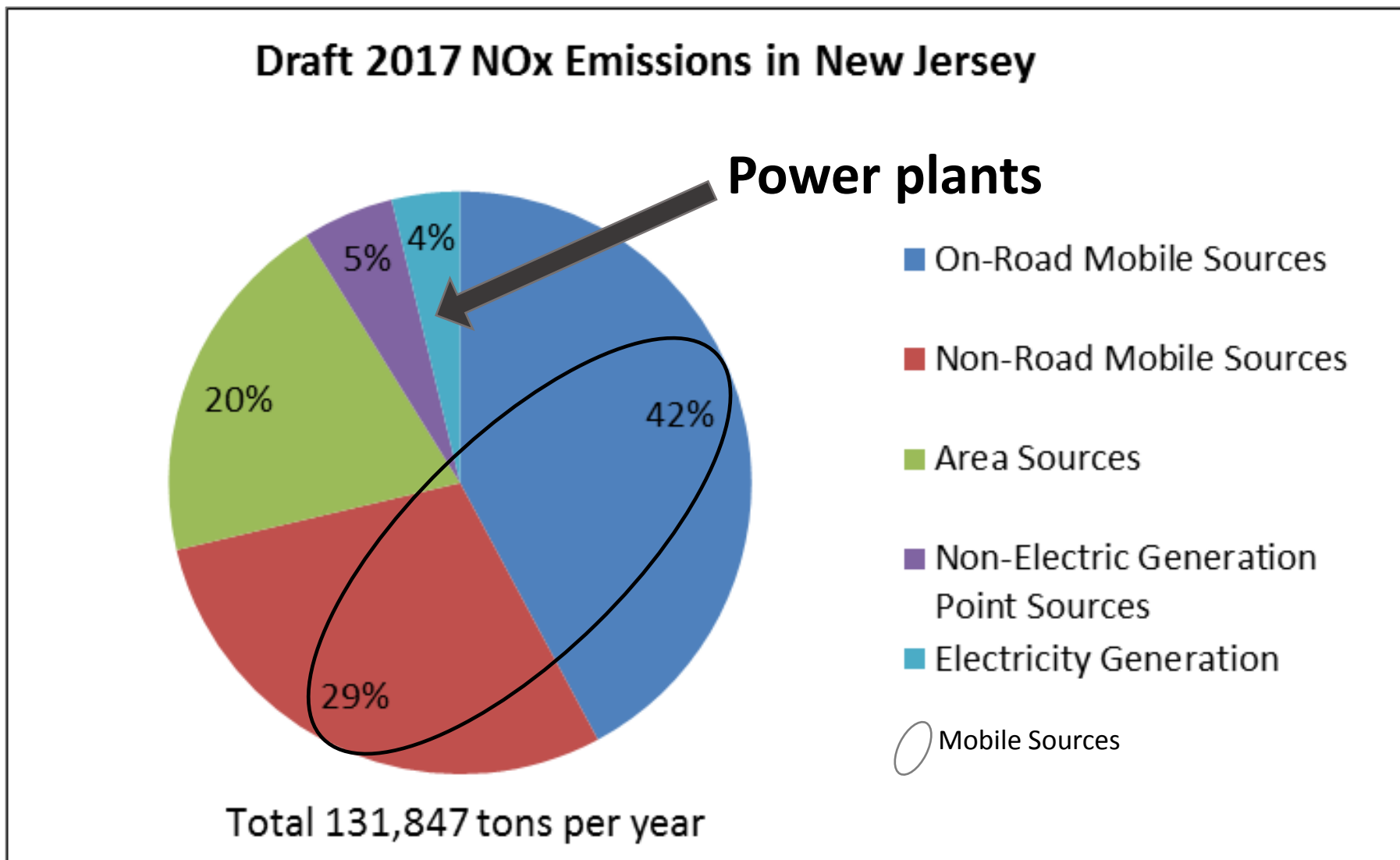
Photo from greenlining.org

TRUTH: New Jersey produces some of the cleanest electricity in the nation.

- 2nd cleanest – sulfur dioxide
- 5th cleanest – nitrogen oxides
- 5th cleanest – carbon dioxide

Emission rates in pounds per megawatt hour compared to other states

Only 4% of NJ's NOx Comes From from Power Plants



MYTH: They'll Crash the Electrical Grid

TRUTH:

- Electric vehicles make up about 1% of total U.S. auto sales.
- Utilities and state energy agencies are planning ahead for a smooth transition

MYTH: They're Too Expensive

TRUTH:

Electric vehicles are less expensive than comparable gasoline vehicles when you factor in the total cost of ownership



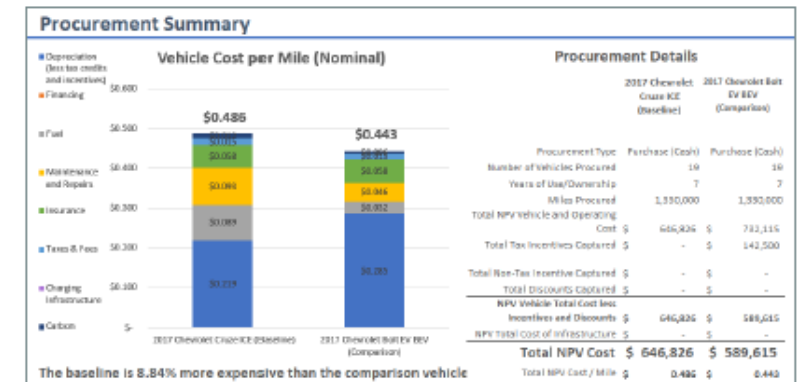
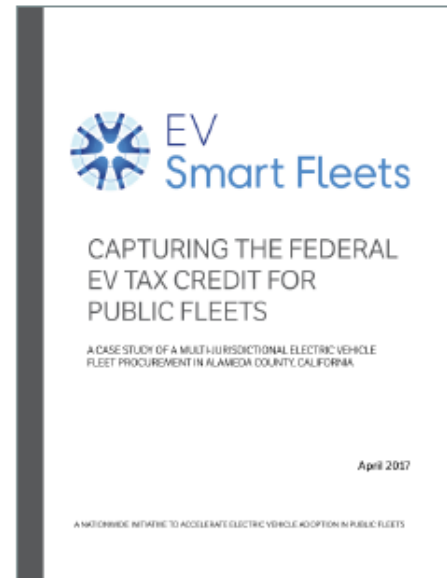
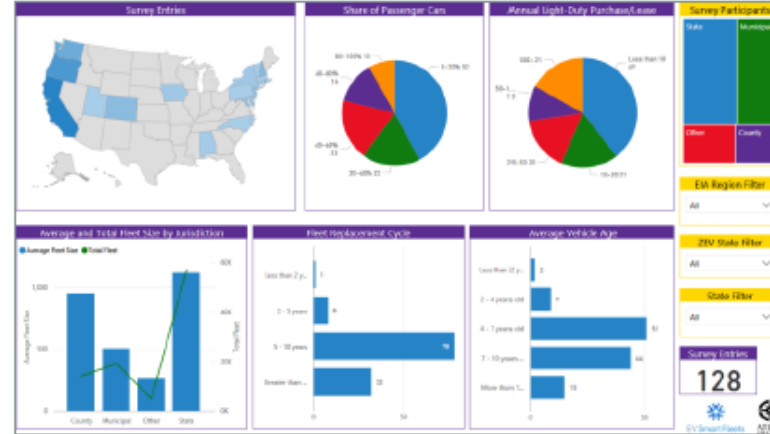
Photo from iStock



Materials on EV Smart Fleets Website

www.evsmartfleets.com

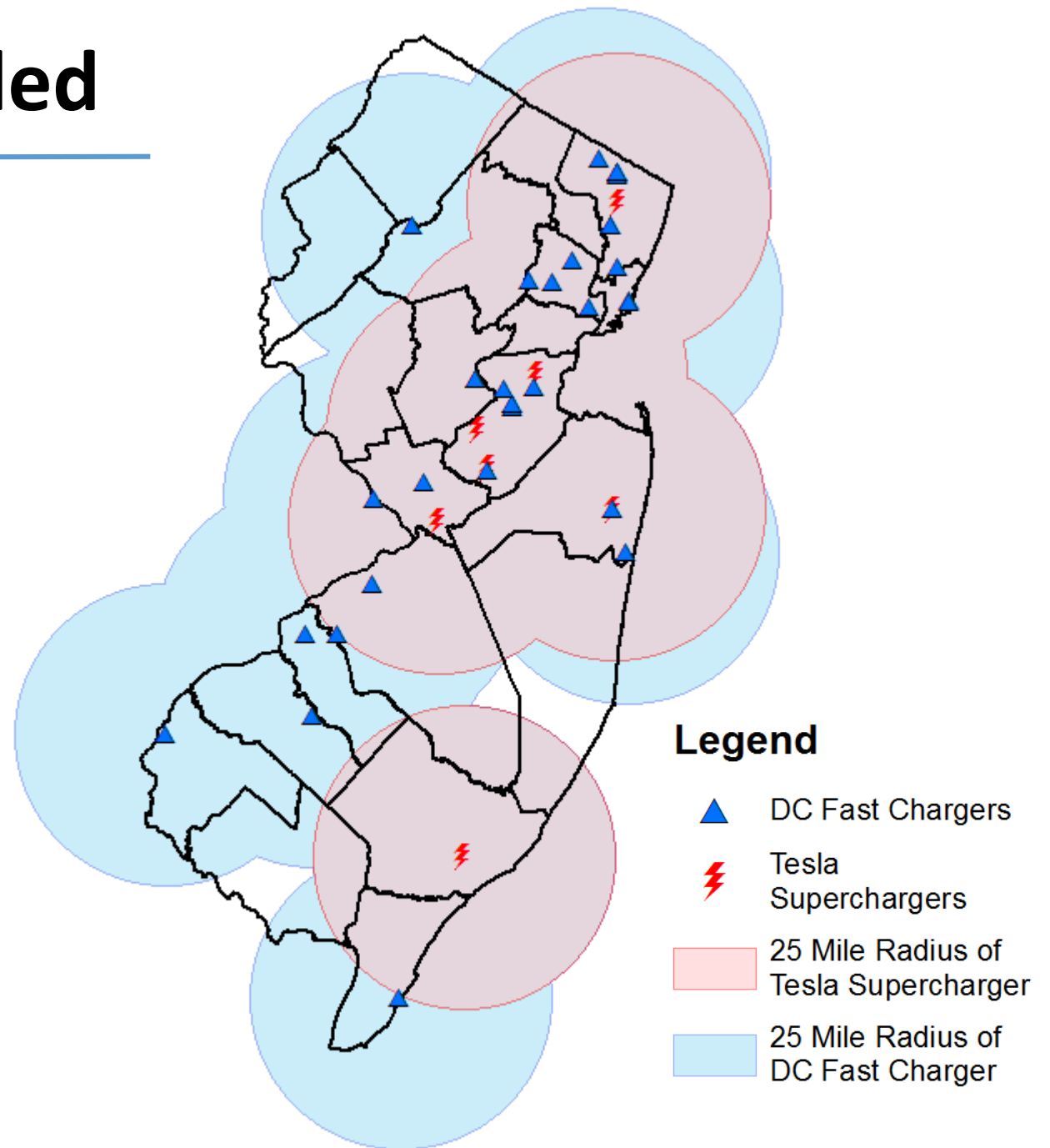
- Explore results from our nationwide survey of public fleets on EV procurement
- Read our case studies and learn about how public fleets have acquired EVs at a low cost
- **Use the Fleet Procurement Analysis Tool to assess how EVs compare to conventional vehicles**



MYTH: I'll Get Stranded

TRUTH:

- NJ has 102 public DC Fast Charging outlets at 42 locations as of June 2016.
- These can charge an EV by nearly 80% in just 20 minutes.
- Many are along major travel corridors, which is perfect for those long trips.



Charging Stations 101

Level 1 - 120V



Source: greentransportation.info

Level 2 – 240V



Source: www.fastcompany.com

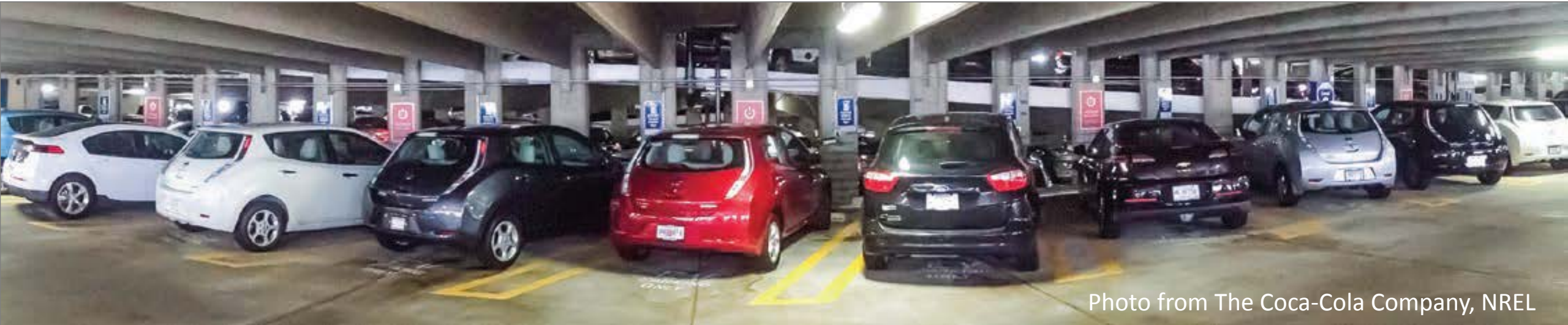
DC Fast Charger – 480V



Eaton DC Fast Charger

It Pay\$ to Plug In

New Jersey's Workplace Charging Grant

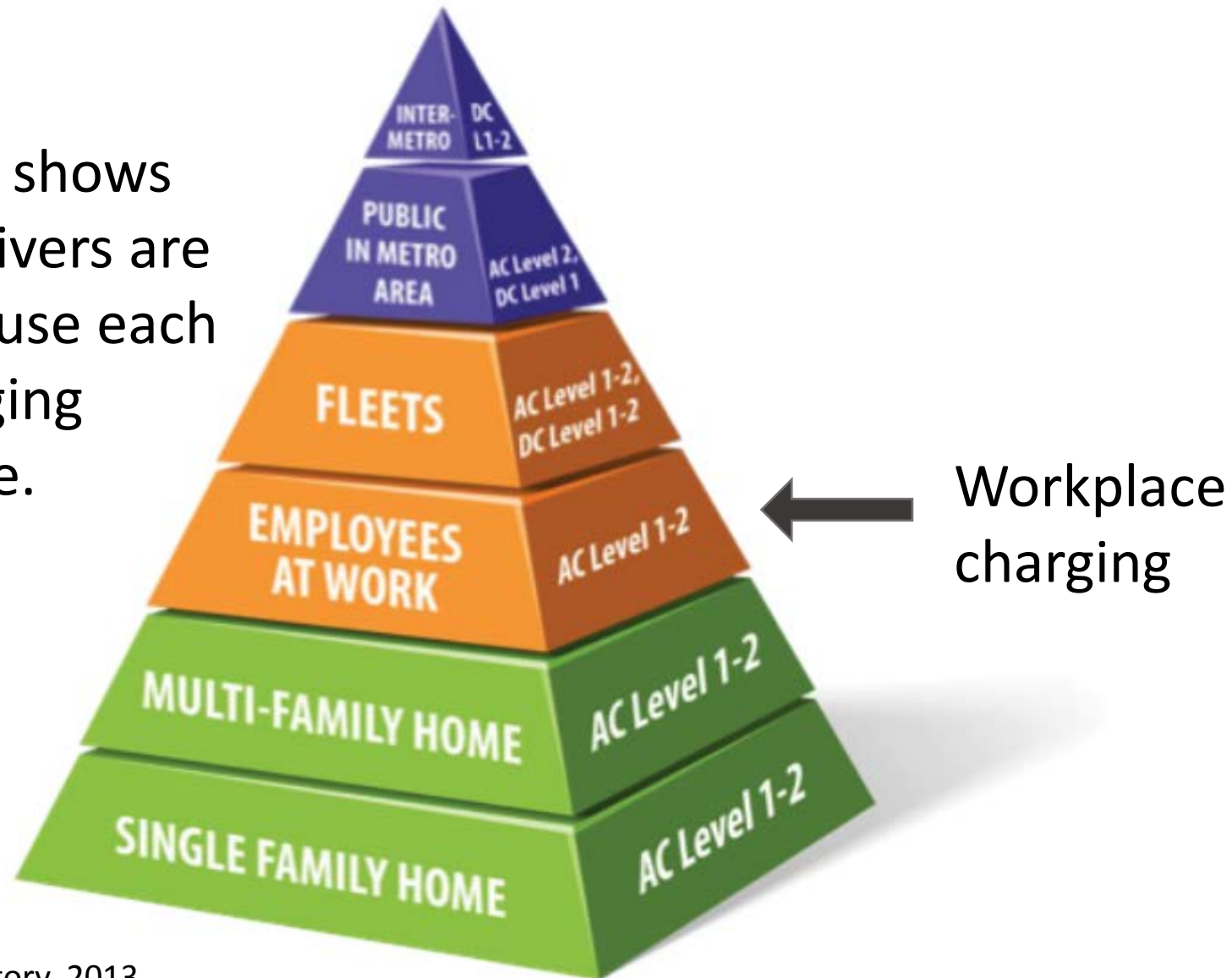


Grants offset the costs for purchase and installation of electric vehicle charging stations

Goal: Encourage employees to purchase and drive electric vehicles to work, and reduce tailpipe emissions

Why Workplace Charging?

This pyramid shows how likely drivers are to need and use each type of charging infrastructure.



Success!

- **Awarded nearly \$850,000 in 11 months to 65 grantees for 182 charging stations**
- Temporarily out of funds, but we are accepting applications for the waiting list
- We are actively pursuing additional funding



Grant Eligibility



Photo from Biofriendly.com

- **All NJ employers:** public, private, for-profit, not-for-profit, educational, and government entities
- Level 1 and Level 2 chargers only

Process

- Apply online before installing charging stations.
- Receive approval letter from DEP.
- Install within one calendar year.
- Receive reimbursement.
 - Up to \$250 per Level 1 charging station
 - Up to \$5,000 per Level 2 charging station
- Contingent on funding. Applications approved on a first-come, first-served basis until funding is depleted.

Congratulations Municipal and County Grantees!

Municipality or County	Level 2 Chargers
Princeton	1
Borough of Bound Brook	4
Hopewell Township	5
Town of Secaucus	4
Borough of Watchung	1
Borough of Bogota	2
Borough of Beach Haven	3

Municipality or County	Level 2 Chargers
Borough of Demarest	3
Borough of Glen Rock	6
Township of Edison	2
County of Hudson	2
Borough of Park Ridge	3
Borough of Rutherford	8
City of Ocean City	1

14 county and municipal grantees will install 45 Level 2 EV charging stations.

NJ Charging Challenge: Electrify Your Workplace

NJDEP wants to recognize NJ employers who are making their workplaces “EV Ready”



Congratulations 2016 winners: PSE&G and The College of New Jersey!

Apply at www.drivegreen.nj.gov/programs.html by September 29, 2017

What's Next?

- More models on the market
- Lower battery costs \implies lower vehicle costs
- More pre-owned EVs on the market
- Expansion of the charging network
- Public input opportunities for the Volkswagen settlement
- Electrify America (Volkswagen) EV charger installations
- Potential funding for *It Pay\$ to Plug In*
- Deadline for the NJ Charging Challenge: 9/29/17

Learn More: DriveGreen NJ Website



www.drivegreen.nj.gov

- Electric vehicle basics
- Grants and incentives
- All about charging
- Which EV is right for me?
- Can I afford it?
- Charging station locator
- Maps and data



Photo by Andrew Hudgins, NREL



Questions?

Brittany Pfeiffer
NJDEP Division of Air Quality
Bureau of Mobile Sources
Brittany.Pfeiffer@dep.nj.gov
(609) 633-7237

Ryan Gergely
NJDEP Bureau of Energy &
Sustainability
Ryan.Gergely@dep.nj.gov
(609) 292-8848

www.drivegreen.nj.gov





Chuck Feinberg

Managing Partner, Greener by Design, LLC

Chairman and Coordinator, NJ Clean Cities Coalition

The New Jersey Clean Cities Coalition is an IRS 501(c)3 non-profit corporation, and is formally designated by the US Dept. of Energy as a Clean Cities Coalition.

We are the only state-wide entity dedicated to the establishment of Public/Private Partnerships for the reduction of petroleum in transportation, and the advancement of alternative transportation fuels and advanced vehicle technologies.



Local & National
Public/Private
Partnerships



Information
& Education

Financial
Assistance

Technical
Assistance

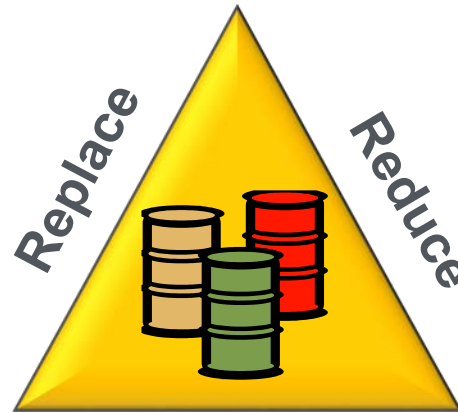
Clean Cities Coalitions are locally based with the ability to tap national resources.

Alternative Fuels

Electric Vehicles
Biodiesel
Ethanol
Hydrogen
Propane
Natural Gas

Fuel Economy

More fuel efficient vehicles,
smarter driving and vehicle
purchasing habits, vehicle
miles travel reductions



Idle Reduction

Heavy-Duty Trucks
School & Transit
Buses
Light-Duty Vehicles



Hybrids

Light- and heavy-duty
Electric hybrids
Plug-In hybrids
Hydraulic hybrids

Post Sandy Theme = FUEL DIVERSIFICATION!

- USDOE designation in 1997
- Incorporated as a NJ Non-Profit and IRS 501(c)3 tax exempt entity in 2009
- Stakeholders represent the spectrum of public and private interests
- Activities funded by:
 - ✓ Member dues (various levels)
 - ✓ Sponsorships
 - ✓ grants & contracts
- Secured more than \$18 million in grants for stakeholders in the past 5 years
- Regular outreach to more than 3000 through: LinkedIn Group, Facebook, Twitter, e-newsletter, www.njcleancities.org

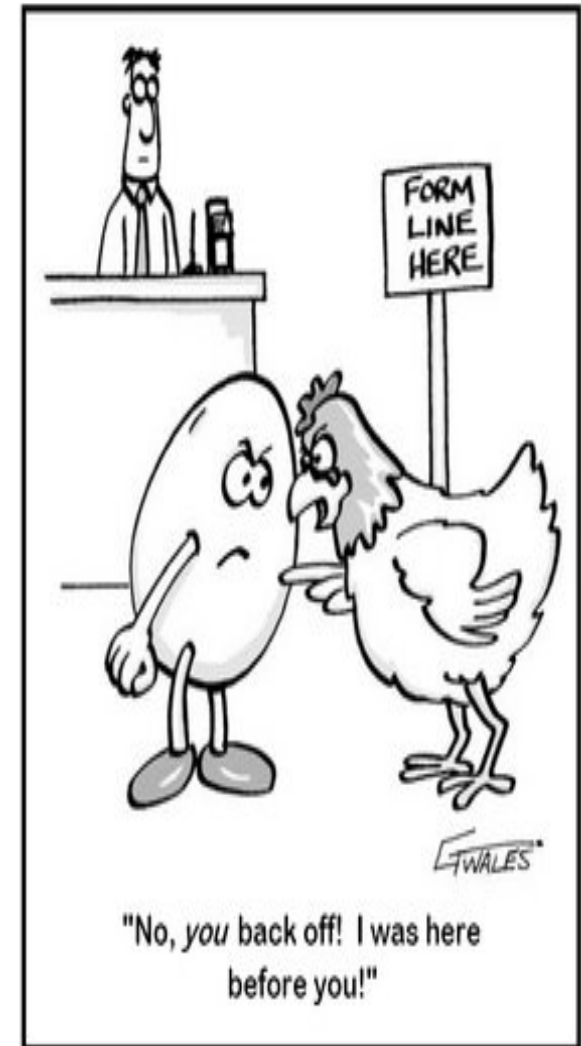
Platinum & Gold members



Public/Private Partnership Projects



- NJ CNG Fleet & Infrastructure Program
- NJDEP EV Policy Support
- NE Regional EV Network Planning
- Marine Vessel Engine Repower
- DOE Clean Cities Program Support
- Initiative for Resiliency in Energy through Vehicles
- Ford EV Social Media Project
- National ZEV Aggregate Purchase Program
- NJTPA Municipal AFV Readiness Plans





- NJCCC led a **public/private team** to implement the first large-scale deployment of AFVs and infrastructure in NJ.
- Effectively **leveraged federal investment** of \$15mil with an additional \$36 mil of non-federal for \$51mil total project cost.
- Transitioned 305 highly visible vehicles to CNG from 15 fleets statewide (trash collection trucks and shuttle buses).
- Installed 6 CNG fueling stations across the state.
- Ongoing outreach & education to further develop the market.
- Base program **displaces more than 2,000,000 gallons**

NJCCC ARRA-Grant Funded Vehicles



Initiative for Resiliency in Energy through Vehicles (iREV)



- Goal: help states and localities understand the energy security benefits of AFVs and fueling infrastructure and support the incorporation of AFVs into emergency response plans.
- Led by NASEO, supported by U.S. DOE and guided by a steering committee of public/ private, and Clean Cities partners.
- Seeking to address the need for fuel diversification and the risks of being overly dependent upon a





Circa 1914, Thomas Edison's Home Charging Station

Full circle at the NPS Edison Lab



Electric vehicle technology options:

- Plug-in hybrid electric vehicles (PHEVs)
- Battery electric vehicles (BEVs)
- Battery electric vehicles with a range extender (BEVx or EREVs)
- Hydrogen fuel cell vehicles (FCEVs)



- Fuel cost savings
- Savings on maintenance
- Lower environmental impact
- Energy security



Compare Electricity Sources and Annual Vehicle Emissions

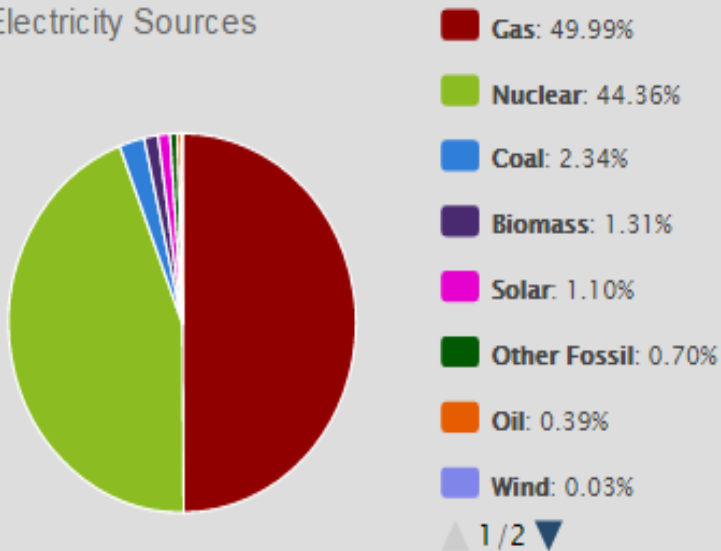
Select a state to see a breakdown of the electricity sources used to charge EVs and PHEVs on a local grid and compare the annual emissions generated from vehicles using electricity from the grid, gasoline, or a combination of the two.

New Jersey

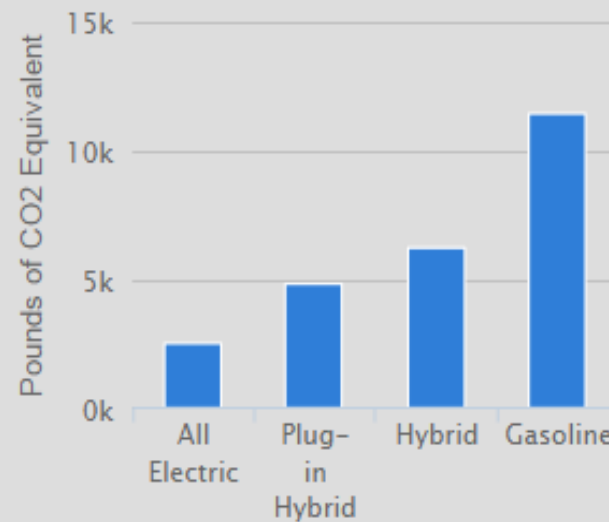
Find Data

State Averages for NJ

Electricity Sources



Annual Emissions per Vehicle



Source: http://www.afdc.energy.gov/vehicles/electric_emissions.php

- The over 200-mile range battery electric vehicle is here!
- From 2012-2017, full battery electric vehicles have increased in range by nearly 2.5x while holding the line on prices

2012 Nissan Leaf
Range - 84 miles
\$35,200 MSRP



2017 Chevy Bolt
Range - 200 miles
\$37,500 MSRP



2017 Tesla Model 3
Range - 200 miles
\$35,000 MSRP



- While still a relatively small percentage of the overall market, all electrified vehicle segments were up substantially in 2017 compared to the first five months of 2016.
- Year-to-date sales
 - hybrids up 10.5%,
 - plug-in hybrids up 48%
 - battery electric vehicles up by 33%

- **Shared-use mobility** - transportation services that are shared among users, including:
 - public transit;
 - taxis and limos;
 - Bike sharing;
 - Ride sharing;
 - car-pooling, van-pooling
 - On-demand services (e.g. Uber, Lyft)
 - shuttle services / neighborhood jitneys;
 - Car sharing.
- Shared-use mobility can increase the opportunity to introduce alternative fuel vehicles



- Car sharing services provide members with access to an automobile for short-term use. The shared cars are distributed across a network of locations within a metropolitan area. Members can access the vehicles with a reservation and are charged by time or by mileage.
- Car sharing services offer several models, including:
 - Round-trip
 - Point-to-point or one-way
 - Peer-to-peer
- Shared-use vehicles allow individuals to gain the benefits of using a private car without the costs and responsibilities of owning one.

- Carsharing has lower fixed costs and higher variable costs than private vehicle ownership. This price structure makes occasional use of a vehicle affordable, even to low-income households (who might not otherwise be able to afford a car).
- Incentives drivers to minimize their vehicle use and rely on other travel options - including walking, cycling and public transit - making it an important transportation demand management strategy.
- Households that use car sharing typically reduce their vehicle use 40-60%. Although drivers who would not otherwise have access to a vehicle may increase their driving due to car sharing, this is more than offset by **reduced driving overall.**

Car Sharing – big business!

- More than 40 car sharing companies throughout the world, with more than 2.4 million members.
- Global car sharing revenue is expected to grow from \$1.1 billion in 2015 to \$6.5 billion in 2024 (Navigant Research)
- The lines between car sharing and car rental have blurred as rental companies like Avis/Budget (Zipcar) and Enterprise (Enterprise CarShare) dominate. Manufacturers such as Daimler, BMW, Toyota, Ford, GM and VW also have a major, and growing, presence.



- Purpose
 - Evaluate the potential for car sharing for NYCDOT employees traveling for official city business
 - Reduce parking footprint of DOT vehicles in Lower Manhattan
 - Improve efficiency of vehicle use at DOT
 - Improve ease of vehicle use for DOT employees
 - Reduce cost of vehicle use at DOT
- Approach
 - Removed 25% of DOT vehicles (50 vehicle reduction) from the Lower Manhattan fleet
 - Trained 350 DOT employees to participate in the car sharing pilot
 - Collected before and after data to evaluate effectiveness

- Results

- Reduced DOT parking impact in Lower Manhattan by 14% during weekdays and by 68% during weekends
- Reduced DOT's Vehicle Miles Traveled by 11%
- Improved vehicular reservation process, vehicular availability and ease of finding parking when returning vehicles
- Continued use of program results in cost savings to DOT

- While PEVs present some logistical challenges for car sharing, they also allow the service to:
 - gain support from regulators/customers looking to promote green initiatives
 - provide an advantage for offering services in cities that are adopting low emissions zones
 - allow automakers to secure zero emission vehicle (ZEV) credits.
- The incorporation of PEVs into shared vehicle fleets exposes this technology to a large array of potential customers that would otherwise have far less or no exposure:
 - exposes more women as well as younger individuals to PEVs relative to the “traditional” demographic profile of PEV owners.
 - influences customer perceptions to be more positive to PEVs

The benefits of car sharing can include:

- More careful consideration of the necessity, duration, and distance of automobile trips, resulting in decreased vehicle use.
- Greater consideration given to alternative modes, resulting in increased transit ridership, biking, and walking.
- Cost savings to individuals and employers.
 - Increased affordability for low-income drivers
- Energy savings and air quality benefits.
 - UC Berkeley report estimates one car-share car displaces approximately 9 to 13 private vehicles
 - Increased exposure to plug-in vehicles
- Reduced parking demand at participating transit stations,

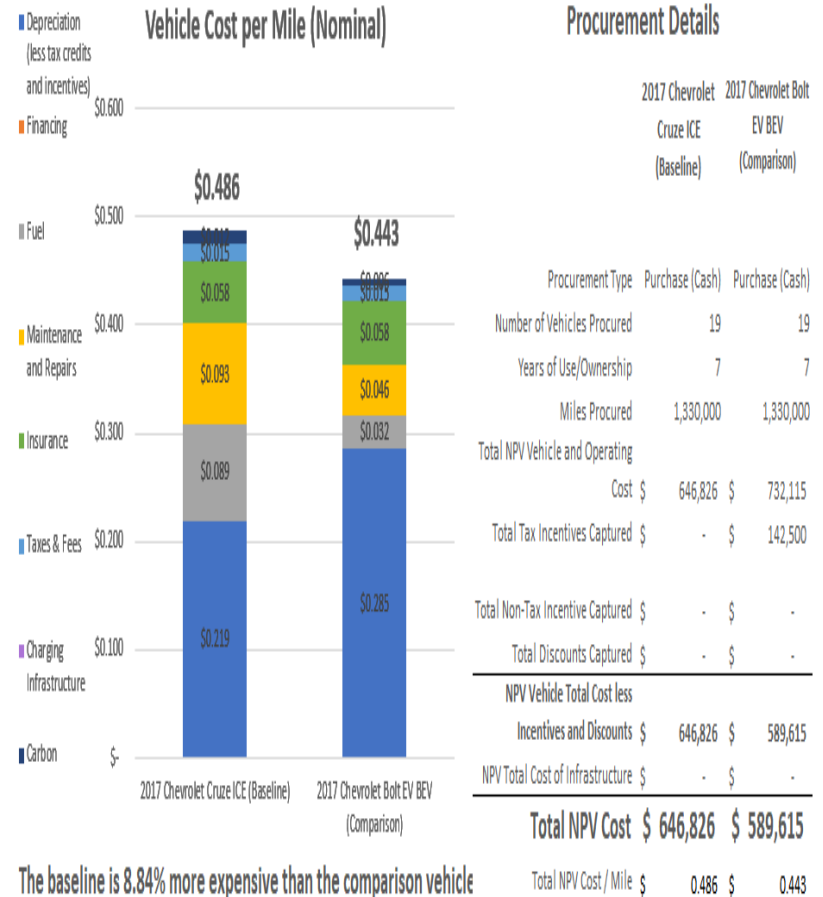
- Start-Stop Vehicle Technologies
 - Shuts down engine to avoid idling
 - Allows better use of energy recovered from regenerative braking
- “Connected Vehicles”
 - allows sharing of access with other devices inside and outside the vehicle
 - smartphone apps, navigation, roadside assistance, voice commands, parking apps, engine controls and car diagnosis.
 - Users can unlock their cars, check the status of batteries on electric cars, find the location of the car, remotely activate the climate control system.
 - Wireless technologies to communicate in real time from vehicle to vehicle (V2V), from vehicle to infrastructure (V2I), and vehicle to grid (V2G)
 - EV battery could serve as a resiliency tool, with peak shaving or demand response capability.

Aggregate Purchasing – “EV SmartFleets”



- Implement a multi-state EV procurement through the National Association of State Procurement Officials (NASPO) ValuePoint Program open to all state and local governments
- Leverage the purchasing volume of public fleets to reduce vehicle prices and provide access to a wider range of vehicles
- Offer alternative purchase/ownership models that would give public fleets federal tax credit benefits
- <http://evsmartfleets.com>

Procurement Summary



The baseline is 8.84% more expensive than the comparison vehicle

Chuck Feinberg

**Chairman of the Board of Trustees,
USDOE-Designated Coordinator
New Jersey Clean Cities Coalition, A NJ Nonprofit
Corp**

www.njcleancities.org

Twitter: @njcleancities

LinkedIn Group: New Jersey Clean Cities Coalition

Managing Partner, Greener By Design, LLC

www.gbdtoday.com

cfeinberg@gbdtoday.com





Final Thoughts



Collective Impact:

n. the commitment of a group of actors from different sectors to a common agenda for solving a specific social problem, using a structured form of collaboration