



Sustainable Westchester

Clean Transportation Project



Town of Ossining

March 21, 2017





Today – March 21, 2017

GOVERNOR CUOMO LAUNCHES \$70 MILLION ELECTRIC CAR REBATE AND OUTREACH INITIATIVE

*Drive Clean Rebate Provides Up to \$2,000
for Each Eligible Buyer*

*Supports Governor's Goal to Reduce
Greenhouse Gas Emissions 40 Percent by 2030*

*Largest Contributor to Greenhouse Gas Emissions is
Transportation Sector:*

Accounts for Nearly 40 Percent of Emissions in New York State





New York State Energy Plan

2030 Goal:

23% **Decrease**
in energy consumption in buildings from 2012 levels

50% **Generation**
of electricity from renewable energy sources

40% **Reduction**
in GHG emissions from 1990 levels

2050 Goal: 80% Carbon Reduction



SW Clean Transportation Project

Goals:

1. Reduce Municipal Fleet **Fuel & Maintenance Costs** by 25%
2. Cut Municipal Transportation
Greenhouse Gas (GHG) Emissions
3. **Upgrade Municipal Fleets**
with Cost-Effective, Mission Compatible **Electric Vehicles**
4. Put municipalities in a **leadership role**
in clean transportation models





Municipal Fleet Carbon Emissions

6 Westchester Climate Action Studies found that

Fleets are responsible for 60%
of all municipal operation
Greenhouse Gas emissions

(so, ~60% of all energy costs, too)

** NWEAC 2012 Climate Action Plans for*

Cortlandt, Croton-on-Hudson, North Salem, Peekskill, Pound Ridge, Somers





Average US Vehicle Trips



US Dept of Energy:

57% of US trips are <6 miles

90% of all US trips are <30 miles



Today's Electric Vehicles can typically travel about 80+ miles on a full charge, more than enough for the daily driving needs of many fleet applications.



2008 - 2016

US Cumulative EV sales

since the market launch of the [Tesla Roadster](#) in 2008

570,187

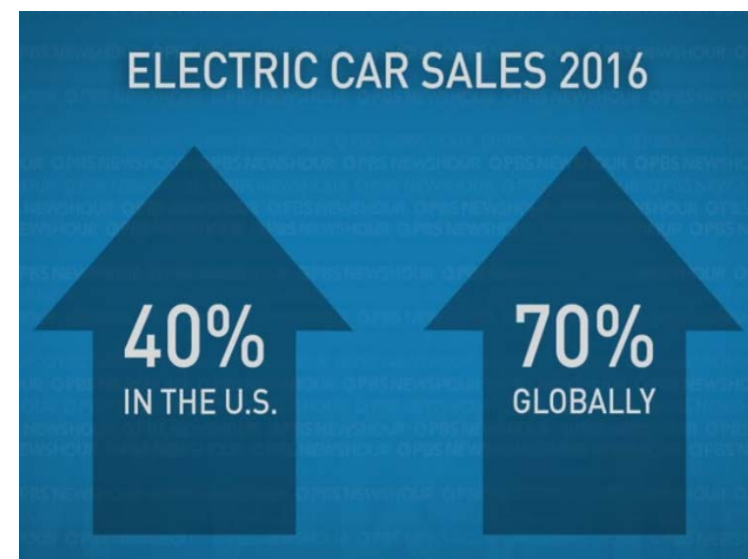
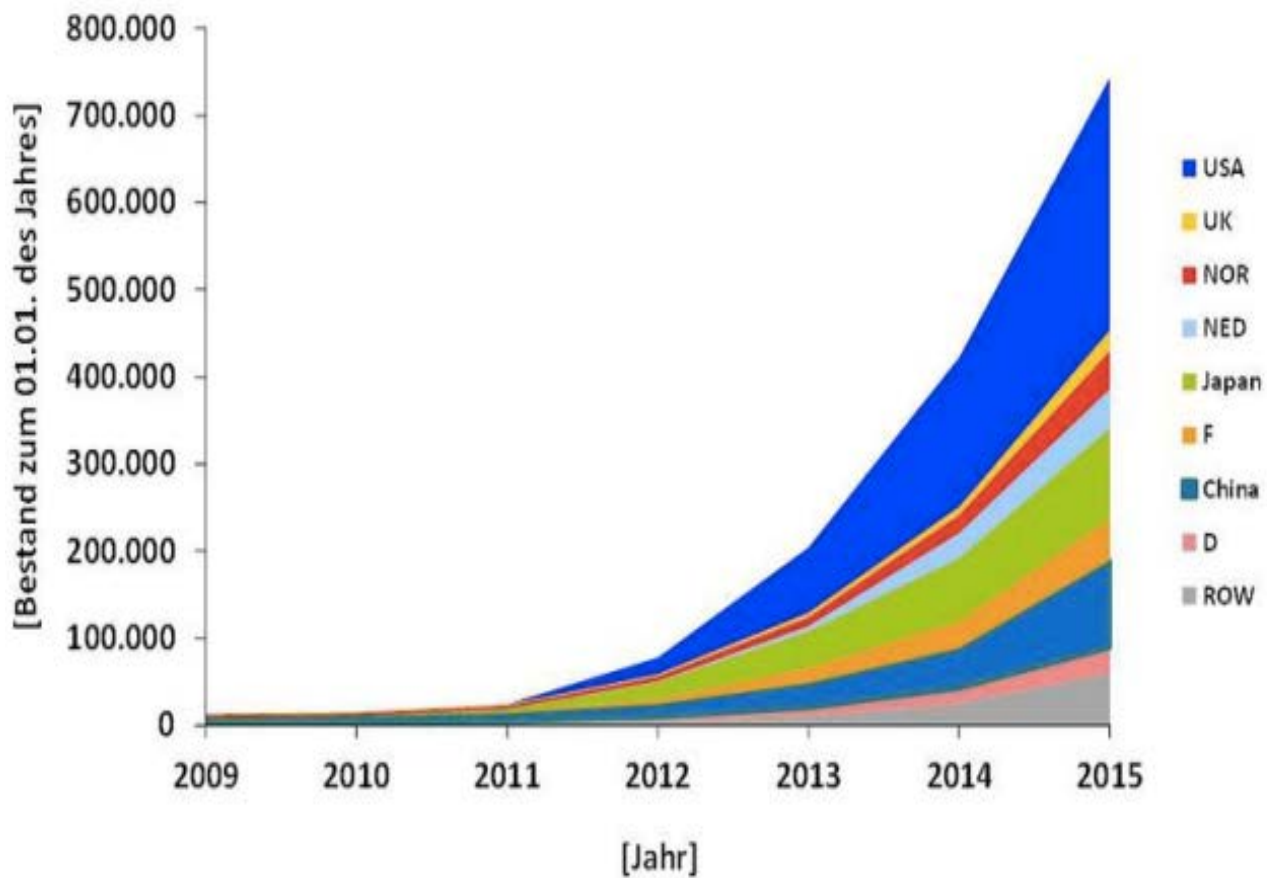
Plug In Electric Vehicles on U.S. roads today

(2+ million world-wide)





EV Exponential Growth





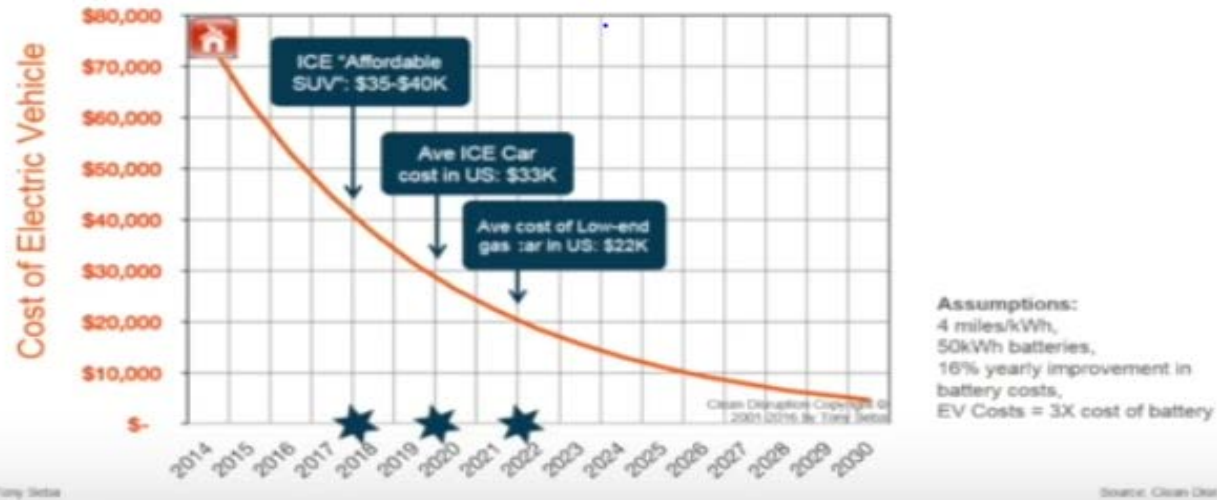
Exponential Growth & Price Decreases

EV prices are dropping by ~18% per year

*By 2020 - EVs are projected to be cheaper to buy
(& 10x cheaper to maintain).*



**Disruption from Above:
Cost of EV with 200-mile (320 Km) range**





Efficiency

Electric Vehicles are 5x More Efficient than gas vehicles
which lose ~80% of their energy as heat.





Reduced Maintenance

**Gas cars have
~2,000 moving parts.**

*Transmission, driveshaft, clutch, valves,
differentials, pistons, gears, crankshafts...*

2,000+ moving parts (1)



**Electric Vehicles have
<20 moving parts!**



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Cost Savings

It costs less than half as much

to travel the same distance in an EV
than a conventional gas powered vehicle.

EVs create a value proposition

equivalent to paying

\$1.00/gallon with gas vehicles





Gas vs. EV Fuel Costs

A **gas vehicle** traveling
10,000 miles / year @ 20 mpg = 500 gallons of gas.

@ \$2.00 / gal = **\$1,000 / yr.**

An **Electric Vehicle** *traveling*
10,000 miles / year @ 4 KWh / Mile = **2,500 KWhs**

@ \$.25/kwh = **\$625 / yr (37% savings)**

@ SW Municipal Solar Buyers Group Pricing @ \$.15/kwh = **\$375 / yr (62% savings)**

~2/3rds less \$\$\$ (& GHGs)





Tesla Model S

0 to 60 mph in 2.5 seconds





Performance – Formula E Prix



Leonardo DiCaprio &
Venturi Automobiles

Venturi currently holds the
world land speed record for an
electric vehicle:


307 mph

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Fiaformulae.com



NEWS ▾CALENDARCHAMPIONSHIP ▾RESULTS ▾MORE ▾TICKETSHOW TO WATCH



UPCOMING RACES

17

DAYS

8


HOURS

28

MINUTES

29

SECONDS

OFFICIAL TIMEKEEPER


R3 | 18 FEB 2017
 **BUENOS AIRES, AR**
Formula E Buenos Aires ePrix
 **BUY TICKETS**

R4 | 01 APR 2017
 **MEXICO CITY, MX**
FIA Formula E Mexico City ePrix
 **BUY TICKETS**

R5 | 13 MAY 2017
 **MONACO, MC**
Monaco
 **BUY TICKETS**



BUENOS AIRES
Circuito de Puerto Madero

Official Lap	José María López
Points to Winner	100
Track Direction	Anticlockwise

2.480 KM
LENGTH

12
TURNS





Tesla Model 3

\$35,000

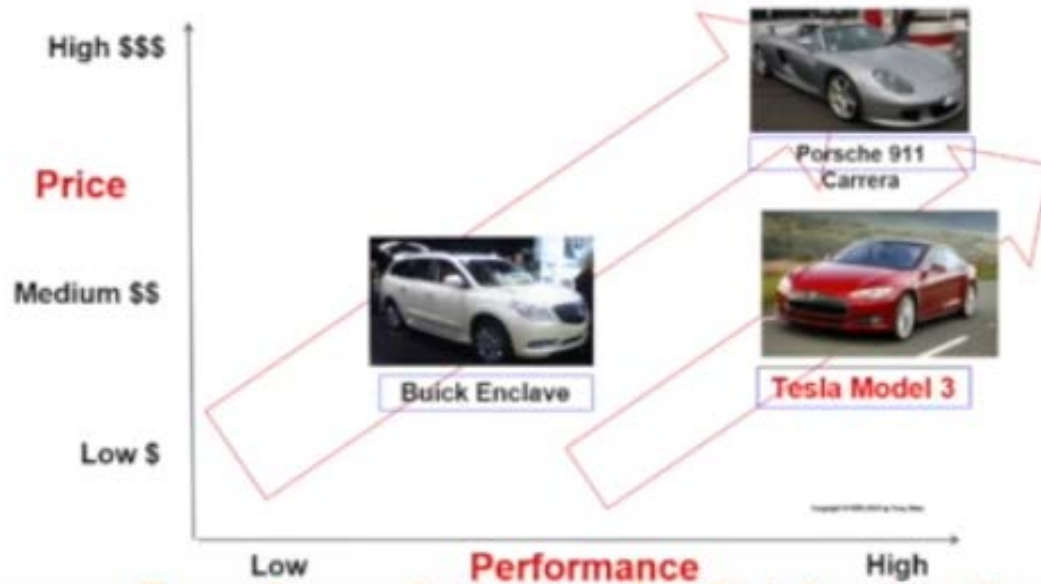
400,000 Reservations = \$400M Deposits





Disrupting Price & Performance

**EVs Shift the Price/Performance equation:
Disrupt the BASIS of COMPETITION**



Performance of a Porsche

At the Cost of a Buick





On the Road Today



Sample Electric Vehicle List & Published Pricing



[2017 BMW i3 - \\$43,395](#)

22-33 kWh **battery**, 81-114 miles, 118-124 MPGe, 125 kW motor



[2017 Chevrolet Bolt EV - \\$37,495](#)

60 kWh **battery**, 238 miles (EPA), 119 MPGe, 150 kW motor



[2017 Fiat 500e - \\$32,780](#)

24 kWh **battery**, 84 miles (EPA), 112 MPGe, 83 kW motor



On the Road Today



2017 Ford Focus Electric - \$29,995

33.5 kWh battery, 115 miles (EPA), 107 MPGe, 107 kW [motor](#)



2017 Hyundai Ioniq Electric - N/A

28 kWh battery, 124 miles (EPA), 136 MPGe, 88 kW [motor](#)



2016 Kia Soul EV - \$32,800

27 kWh battery, 93 miles (EPA), 105 MPGe, 81 kW motor



2017 Mercedes-Benz B250e - \$40,825



2017 Mitsubishi i-MiEV - \$23,845



2017 Nissan Leaf - \$31,545





Municipal Fleet Study

Center for Sustainable Energy (CSE).

EV suitability assessment for public fleets in
disadvantaged communities across California.

**“80% of the 85 vehicles tracked could be replaced with EVs —
90% of sedans and 50% of pick-up trucks”**

*“If each fleet replaced all the recommended vehicles with the best-fit EV,
**the fleets would save an average of
nearly 25% of estimated total cost of ownership
over the life of the vehicles..”***





Philadelphia

The City of Philadelphia, Pa., is adding plug-in hybrid vehicles to its Police Department for community outreach.

**The city will have 17
Plug In Hybrid Electric vehicles —
standard gasoline hybrids with plug-in capability.**

*On a full charge they will travel 22 miles
before the gasoline engine kicks in,
and they can get up to the equivalent of 97 miles per gallon.*





NYC

“NYC is one step closer to reaching its goal of creating the [largest electric municipal fleet](#) in the country.

The city has reached an agreement to acquire 1,000 all-electric pure EVs by the end of 2017.

The new [electric vehicles](#) will assist the city in reaching its objective of **cutting municipal vehicle emissions in half** by 2025 as part of its [Clean Fleet Initiative](#).”





Los Angeles

“BMW is leasing the LAPD 100 of its i3 all-electric plug-in vehicles, which the LAPD is using for community outreach and other police business



The BMWs go
80 to 100 miles
on one electric charge,

& are available with a gas-engine
“extender” that increases the range
to about 150 miles.

They will be leased for \$387 a month.”





Municipalities Leading

January 13, 2017

“Four US cities are looking into making a massive order of electric cars.

Los Angeles, San Francisco, Seattle and Portland, Ore.,
sent in a request for information (RFI) to automakers for what could become
the biggest electric car order ever:
24,000 vehicles.

The goal: to show the purchasing power of local governments in the EV market.

The cities said they are aiming to...

*...cut greenhouse gas emissions, decrease reliance on fossil fuels, improve air quality,
and reduce fuel and maintenance costs by an average 37 percent.”*





Municipalities Leading

March 17, 2017

30 cities join to explore \$10 billion electric-car purchase

While federal policies to reduce vehicular emissions of carbon dioxide are now back in the limelight, it's a different story on the state and local level.

A group of 30 U.S. cities is discussing a major purchase of electric cars for their municipal fleets.

The cities have jointly asked automakers for cost and feasibility estimates of

114,000 Electric Vehicles.





New EVs Coming



| NEWS

Ford Adding Electrified F-150, Mustang, Transit by 2020 in Major EV Push; Expanded U.S. Plant to Add 700 Jobs to Make EVs, Autonomous Cars

- Ford confirms seven of 13 new global electrified vehicles coming in the next five years, including F-150 Hybrid, Mustang Hybrid and Transit Custom plug-in hybrid
- Ford to launch fully electric SUV with an estimated range of at least 300 miles and two new electrified police vehicles

The moves are part of a **\$4.5 billion investment in electrified vehicles by 2020**, offering customers greater fuel efficiency, capability and power across Ford's global vehicle lineup.





Soon to come...





Soon to come...



PEVs are suitable for many applications, including military cargo delivery. Photo from Smith Electric Vehicles, NREL/PIX 17631



A variety of medium- and heavy-duty PEVs are available. Photo by Trish Cozart, NREL/PIX 19544



Corporate fleets use PEVs to reduce fuel costs and demonstrate their environmental commitments. Photo by Trish Cozart, NREL/PIX 19543



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Soon to come...

LAPD may roll out a Tesla Model S police car as soon as 2017

Model S P85D





Soon to come...

California School District Creates First-of-Its-Kind Zero-Emissions Bus





Soon to come...



The **BYD T7** trucks comes with a 23,600 GVWR and 124 miles of range. Take a look at the [fact sheet](#) for the full rundown on the specs. This big guy can be designed as a refrigerated box, a stake bed, or with a bucket depending on the application.

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NYS Grants

NYS “CLEAN VEHICLES & INFRASTRUCTURE” offers

\$3 Million in municipal grants

(due March 31, 2017).

*“A total of \$3,000,000 will be distributed to municipalities
for the purchase or lease of clean vehicles
and infrastructure projects
which support public use of clean vehicles.”*





Clean Vehicles Grants

Purchase or 3 year lease

\$5,000 rebate for vehicles
with electric range of **50+ miles**
(e.g., Nissan LEAF, BMW i3...)





Charging Infrastructure Grants



Charging Infrastructure:
80% of cost
Up to **\$250,000** per facility

used primarily
(but doesn't have to be exclusively)
for public charging





NYS Office of General Services (OGS)

Aggregate EV Purchase in February 2017

Winner: Nissan Leaf

84 Miles per Charge





Nissan Leaf

List Price: **\$32k**

OGS Discount: **(\$10k)**

OGS Aggregate Price: **\$22k**

NYS ZEV Grant: **(\$5k)**

NET PRICE: **\$17k**





Sustainable Westchester Municipal Lease

5 Year (60 Month) Lease \$1 Buyout

Payments: **\$365/month**

Annual Payments: **\$4,380**

5 Year Payments: **\$21,900**

NYS ZEV Grant: **(\$5,000)**

5 Year NET Payments: **\$16,900**





Ossining Municipal Lease

1st Year Payment:


\$ 4,380

NYS ZEV Grant:

(\$5,000)

ZERO 2017 Fiscal Impact





Charging Stations – 80% Grant (Mar 31st)



Total Installed Cost / Station: \$20,000

NYS Grant (80%): (\$16,000)

Net Cost: \$ 4,000

1 proposed for each of 3 Parks:

Cedar Lane, Engels Park, Ryder Park





Electric Cargo Van & Senior Transport

EMISSION FREE HAULING
DELIVERY • WORK • MAINTENANCE • SERVICE



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Electric Cargo Van & Senior Transport

RIDE GREEN! WORK GREEN! SAVE GREEN!

100% NO GAS VANS SAVE \$100,000⁺ OVER THE LIFE OF THE VAN



COST OF ELECTRIC OVER 300,000 miles

\$24,000

Fuel calculations

Electric = 300,000 miles = .5kw/240,000kw



COST OF GASOLINE OVER 300,000 miles

\$112,500

Fuel calculations

Gasoline = 8mpg/300,000 miles = 37,500 gallons

*Based on \$3.00/gallon

NO BRAKES, OIL CHANGES, TUNE UPS OR FILTERS

SAVING \$15,000





Community Group Buying

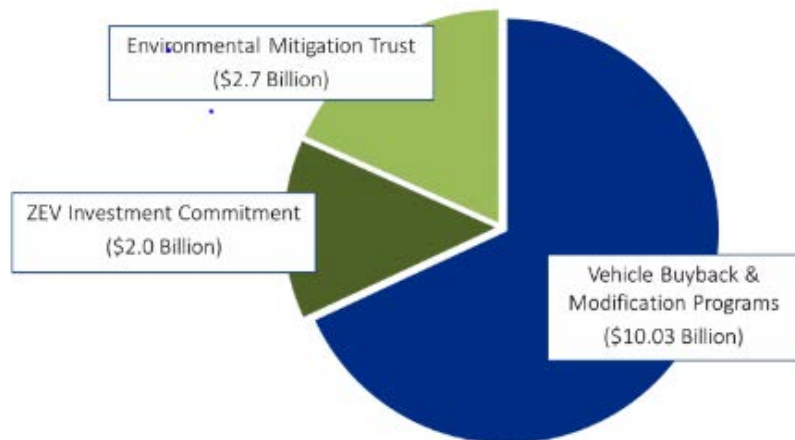
One program run by the Colorado counties
of Boulder, Adams, and Denver
**cut the price of a 2015 Nissan Leaf S
for residents by \$8,349.**

Combined with federal and state incentives,
that **effectively reduced the price of this model
from \$29,860 (including destination)
to less than \$13,000.**





VW Settlement \$14.7B



New York Environmental Mitigation Trust
Allocation:

\$117,402,744



	Environmental Mitigation Trust	ZEV Investment Commitment
Amount	\$2.7 Billion ➤ State specific allocations noted below in Table 1	\$2.0 Billion ➤ \$1.2 billion to U.S. ➤ \$800 million to California
Purpose	Support programs and actions that reduce NOx emissions	Support programs and actions that increase the use of zero emission vehicle (ZEV) technology in the U.S.
Plan Developer	States' designated agent/ beneficiary, such as Dept of Environmental Protection (with input from the public)	Volkswagen (with input from states)
Administrator	Trustee & States' designated agent/beneficiary, such as a Dept of Environmental Protection	U.S. EPA & California Air Resources Board



Town of Ossining – 1st Steps

1. Municipal Lease of Nissan Leaf

5 Year Lease

Net Zero 2017 Impact

Reduced Fuel & Maintenance Costs

Net Town 5 Year Payments: \$17k

2. Three EV Charging Stations

Cedar Lane, Engels Park, & Ryder Park

\$4,000 x 3 = \$12,000





Sustainable Westchester Clean Transportation Project

Sustainable Westchester: 914-242-4725

<http://sustainablewestchester.org/2016/08/electric-vehicles/>



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