

Electrifying City Fleets

Presented by the Alliance for a Sustainable Future



C2ES.ORG

Introducing the Alliance for a Sustainable Future



- **Alliance for a Sustainable Future** is a partnership between The U. S. Conference of Mayors and the Center for Climate and Energy Solutions (C2ES), with a Steering Committee of mayors and business leaders.

Separately, cities and businesses are demonstrating climate leadership. Together, they can accelerate the momentum toward a more sustainable, low carbon future. The Alliance for a Sustainable Future creates a framework for mayors and business leaders to develop and share concrete approaches to reduce carbon emissions, speed deployment of new technology, and respond to climate change impacts.

To date the Alliance has provided case studies, webinars, nationwide survey of cities, policy briefs and speaking engagements.

Learn more:

www.usmayors.org/alliance-for-a-sustainable-future/

and

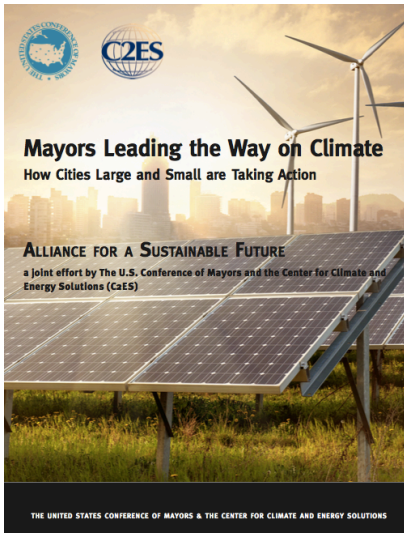
www.Allianceforasustainablefuture.com

Survey: Mayors Nationwide Taking Action



• 2017 Survey

- Alliance gathers data and disseminates information to inform and empower cities and businesses to accelerate climate action together
- Survey collected responses in the summer of 2017
 - renewable energy procurement, building energy policies, and alt. transportation policies
 - 102 responding cities
 - Stay tuned for opening of 2018 survey



Survey: Local Government Fleets

- Of 99 responding cities, 2/3 already purchase green vehicles, and an additional quarter are considering doing so.
- Cities are engaging with state officials on investment ideas for the VW settlement.

Figure 16. Percentage of Cities Pursuing Action with Volkswagen

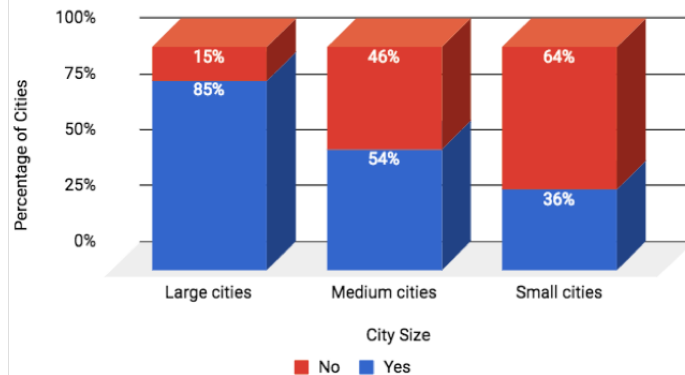


Figure 2. Cities That Purchase Green Vehicles

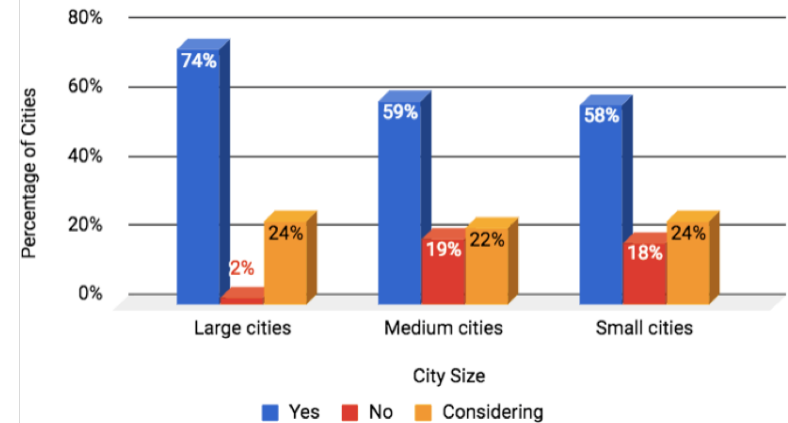
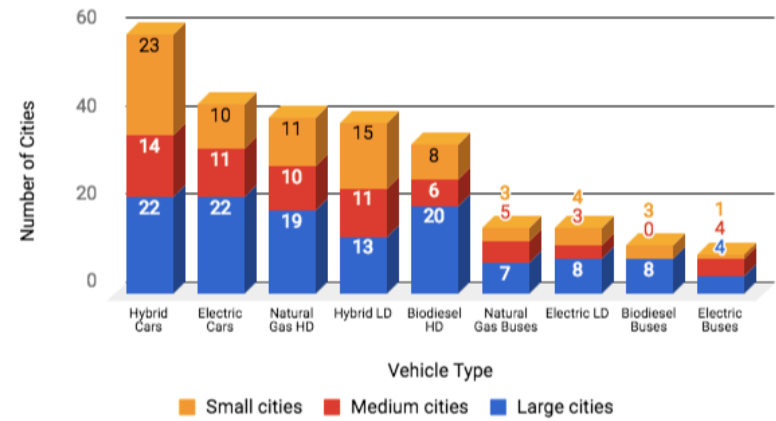
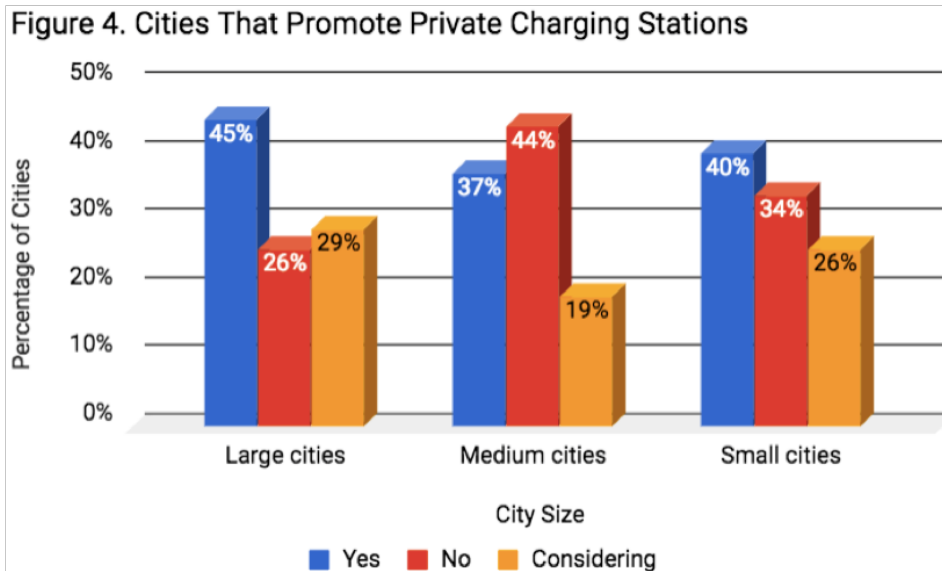


Figure 3. Number of Cities Purchasing Green Vehicles

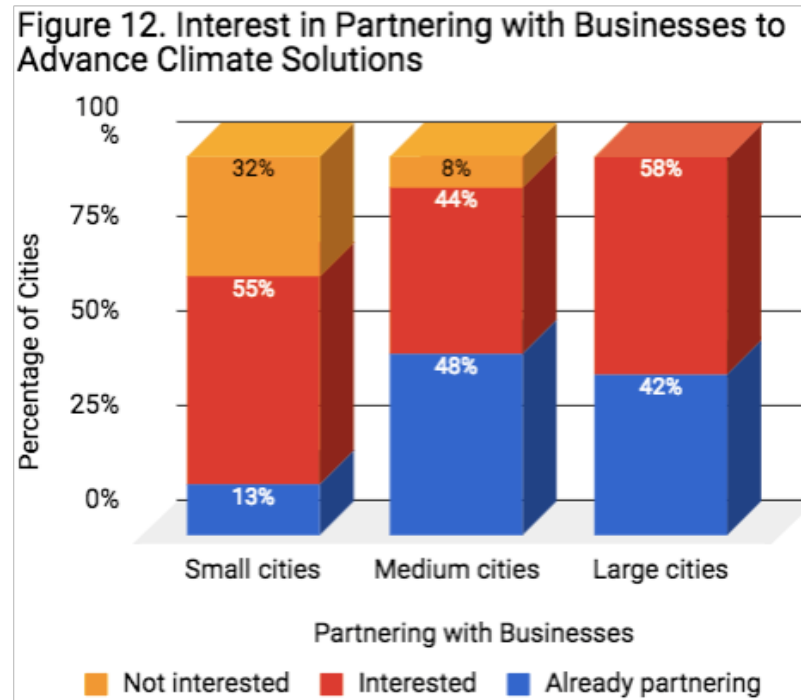


Survey: Policies to Promote Consumer Adoption



- **2/3 of cities have programs in place to promote public charging; an additional 23% are considering doing so.**
- **41% have policies or programs that promote private EV charging infrastructure; an additional 25% are considering such action.**
- **12% offer purchase incentives, 21% considering**

- Local governments are interested in partnering with the private sector to advance climate solutions.





Fleet Electrification Study and Plan

Response to Council Resolution 20160505-025

Council Resolution 20160505-025

“...work with Rocky Mountain Institute, Vulcan, Inc., and Electrification Coalition on an assessment to determine the benefits, timeline, and feasibility of increasing electric vehicle adoption into the City’s Fleet Services vehicles.”

- Evaluate short and long-term cost savings.
- Analyze return on investment options.
- Determine impacts and benefits to Austin Energy.
- Identify electrification targets to achieve carbon neutral fleet by 2020.

Current Fleet Composition



Marked Police Vehicles,
625, 10%

Equipment, Trailers,
Generators, Boats,
Miscellaneous, 326, 5%

Fire and EMS Vehicles,
189, 3%

Solid Waste Packers,
153, 2%

Medium and Heavy Duty
On Road Trucks and
Loaders, 1,430, 23%

Light duty cars, SUVs,
and trucks, 2071, 33%

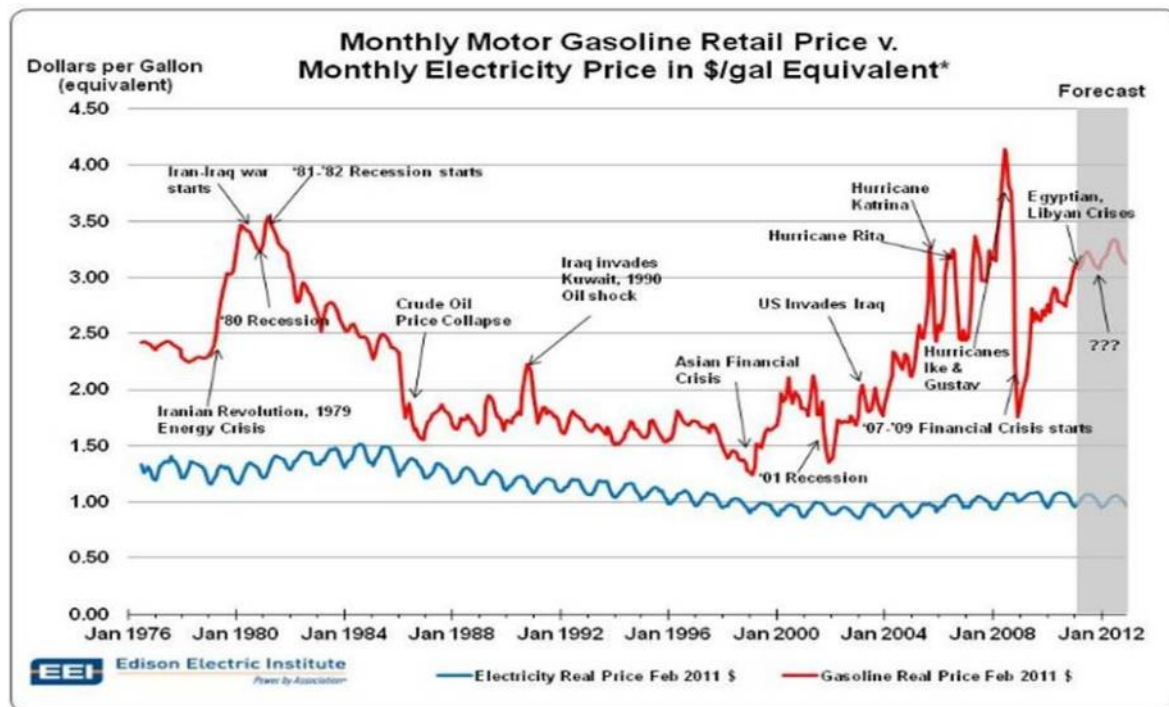
Off-Road Vehicles and
Construction
Equipment, 1,499, 24%

6,500+ Total Units

80% are alternative fuel capable or hybrid

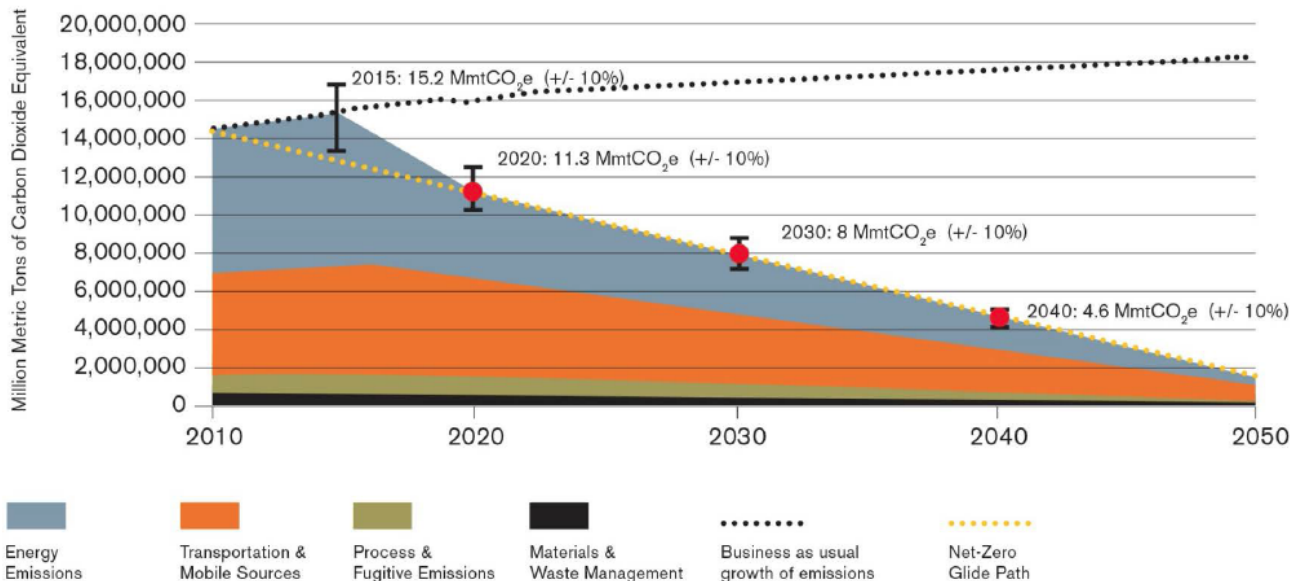
Electric Vehicle Economic Benefits

- Lower life-cycle costs than gasoline vehicles.
- Supports the local economy by purchasing kWh from Austin Energy.
- Reduces fuel price volatility risk.



Electric Vehicle Additional Benefits

- Supports Council adopted goal of Net Zero Community Wide GHG emissions by 2050.
- Demonstrates innovation and leadership to employees and the community.
- Diversifies the City fleet.
- Fuel independence.



Fleet Analysis

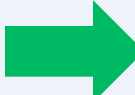
Fleet Electrification Coalition:

- Analyzed over 1,000 City-owned sedans, minivans, and SUVs
 - Excluded marked police vehicles and pickup trucks
- Identified best electric vehicle candidates:
 - Older vehicles
 - Low daily mileage vehicles
 - High lifetime mileage vehicles
 - Expensive-to-operate SUVs and minivans
- 330 vehicles targeted for electrification

Charging Infrastructure analysis

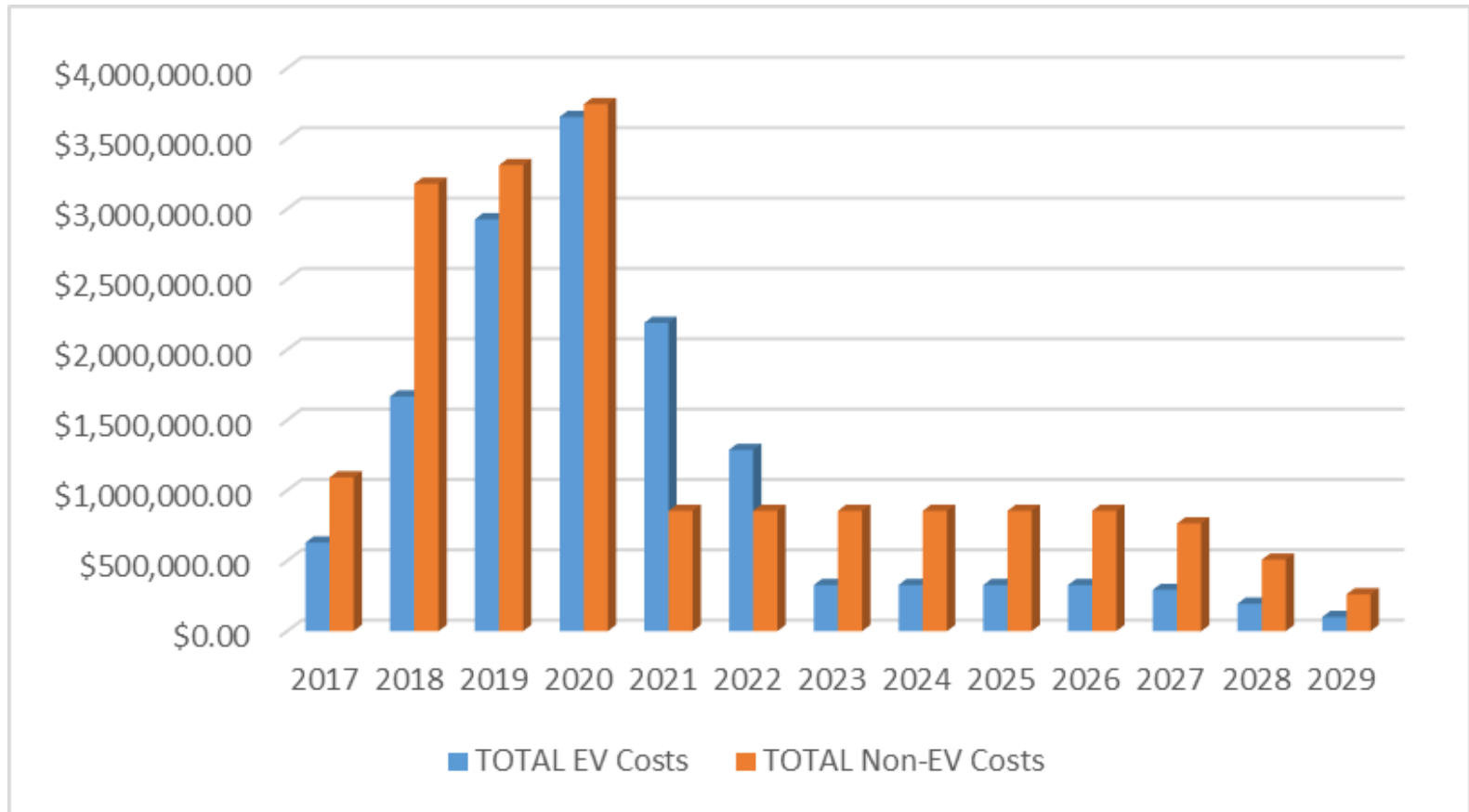
- Analysis of existing charging infrastructure
- Identification of vehicle parking locations
- Determination of optimal “new” charging station locations.

Life Cycle Cost Analysis

10-year Life-Cycle	Continue Current Operations (Gasoline & Alt Fuels)	Electrification of Vehicles (Muni Lease)	Savings
Vehicle Purchase Cost	\$9,400,000	\$9,400,000	\$0
Lifetime Maintenance Cost	\$4,400,000	\$2,300,000	+\$2,100,000
Lifetime Fuel Cost	\$4,200,000	\$1,100,000	+\$3,100,000
Infrastructure Development	\$0	\$1,700,000	-\$1,700,000
Auction Proceeds	(\$1,400,000)	(\$1,400,000)	\$0
TOTAL	\$16,500,000	\$13,000,000	 +\$3,500,000

Based on: 330 Electric Vehicles, 10 year-100,000 mile lifetime,
Electricity at \$0.11 / kWh, \$2.25 gasoline, and a \$7,500 EV Tax Credit

13 year Cash Flow



Total Non-EV Cost: \$16,500,000

Total EV Cost: \$13,000,000

10 Year EV Savings: \$3,500,000

Recommendations

1. Add 330 plug-in electric vehicles by 2020.
2. Expand City Fleet charging stations from 33 to 330 by 2020.
3. Explore alternative funding options including the execution of municipal leases (lease-to- own).
4. Fund charging infrastructure through an interdepartmental fuel surcharge.

Vehicle Purchases

GOAL:

330 Plug In Hybrid and Battery Electric vehicles that are charged at City facilities by the end of CY 2020.

- **35** vehicles by the end of CY 2017
- **134** total vehicles by the end of CY 2018 (add 99)
- **229** total vehicles by the end of CY 2019 (add 95)
- **330** total vehicles by the end of CY 2020 (add 101)

Municipal Lease to own:

- Spreads initial costs over 3 years
- Takes advantage of \$7,500 federal tax credit per vehicle

These vehicles will avoid over 15,000 mt CO₂e over their lifetime

Charging Infrastructure Implementation

Currently 33 charging stations deployed

Add 100 stations by the end of CY 2018:

- 10 Departments
- 15 Building locations
- All Level 2 Charging

Things that help

- Data, Data, Data
- Control over new and replacement vehicle purchases (Centralized Fleet)
- Communication with customer departments
- Creative funding ideas
- Evaluate performance and adjust as necessary

Challenges

- Fear of new technology (customers)
- Availability of maintenance support
- Costs (budget/finance)
- Lack of available technology (supporters)

March, 2018

Accelerating Electric Vehicle Adoption in New York City



Greenhouse Gas Emission Reduction Targets



- **Citywide Goal:** Committed in 2015 to reduce greenhouse gas emissions 80% by 2050 based on 2005 levels
- In May 2017 the Mayor recommitted to the Paris climate agreement goal of limiting global temperature rise to 1.5 C with aggressive near term 2020 emission reduction goals
- As of 2016, Transportation accounts for nearly 30% of citywide greenhouse gas emissions

A photograph of a busy city street at night, likely in New York City. The image shows a line of cars in traffic, with their headlights and taillights illuminated. The background is slightly blurred, showing more vehicles and city lights. The overall tone is dark with warm highlights from the car lights.

90%

**of emissions from NYC's transportation
system comes from private cars**

Source: @NYClimate

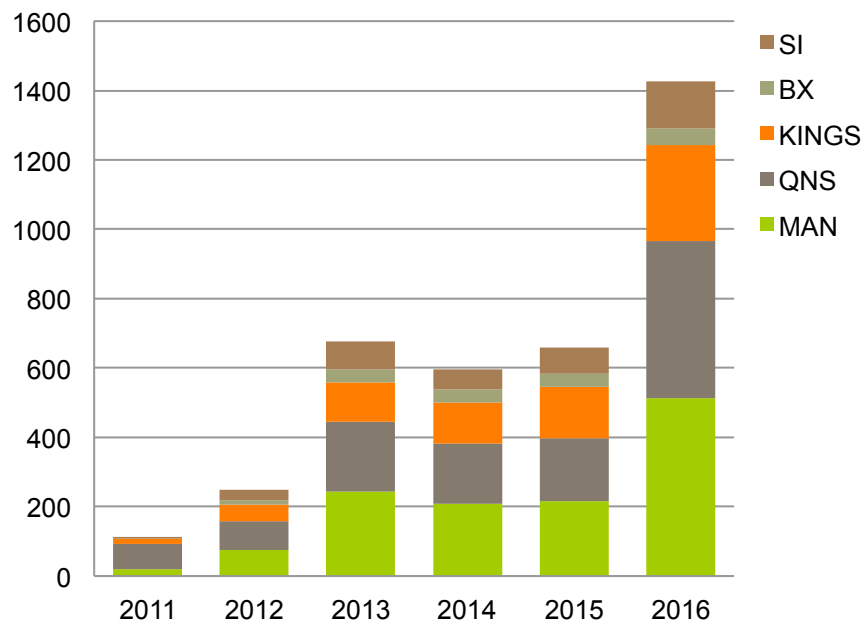
Why Go Electric?

- Zero tailpipe emissions
- Contribute to improving air quality; reducing related respiratory issues
- Incentives include rebate programs and investment in EV charging infrastructure

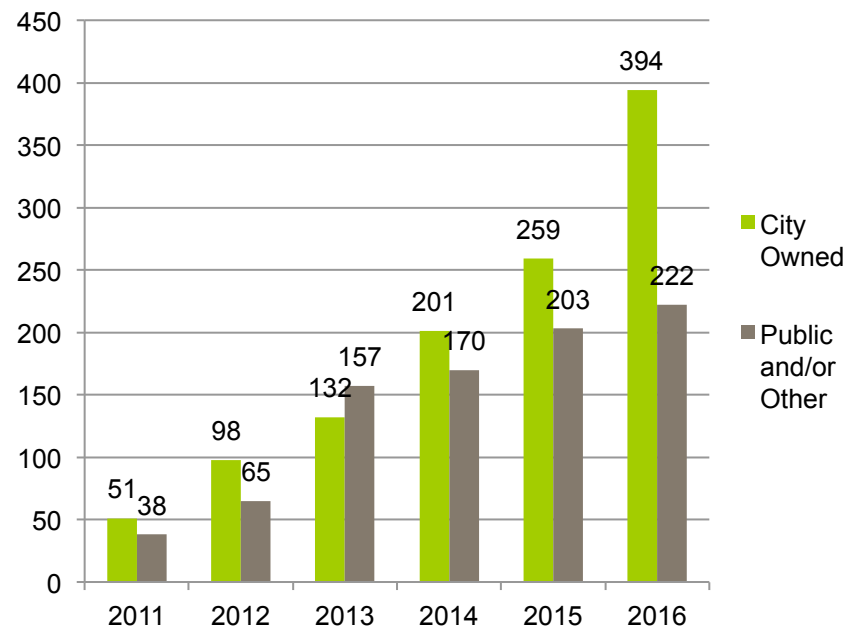
EV Market in New York City

Current: Less than 1% of new vehicle registrations are EVs

Goal: 20% new vehicle registration are EVs by 2025



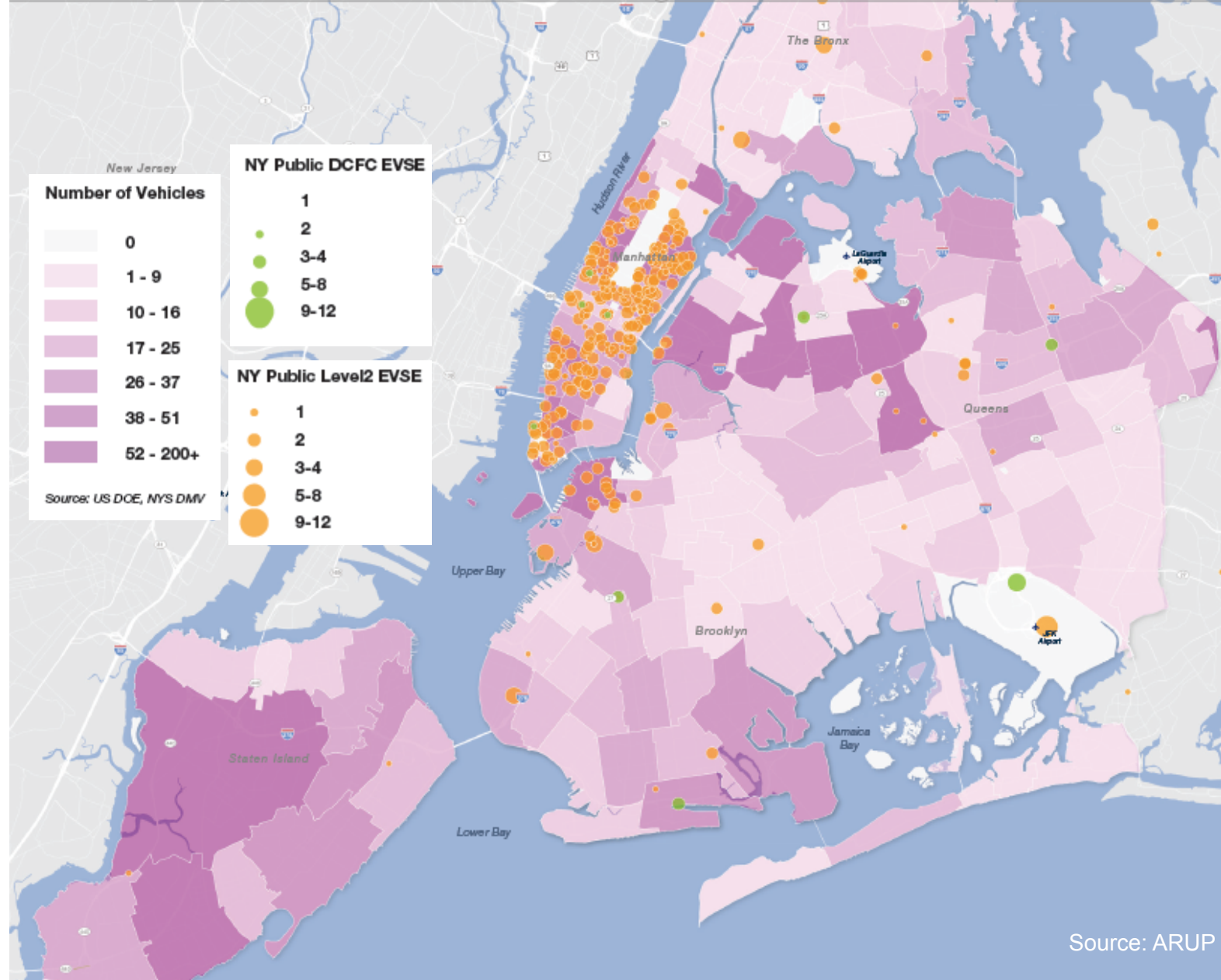
New EV Registrations in New York City 2011-2016





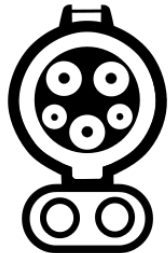
Number of City & Non-City Charging Stations 2011-16

Source: Polk Data

EV Ownership and Publically Accessible EV Charging Locations



EV Charging Types

	Level 1 	Level 2 	Level 3 (DC Fast) 
Power Requirements	120V (1-3 kW)	240V (3-10 kW)	480 V (25-150 kW)
Charging Speed	5 miles per hour, 12+ hours for a full charge	12-25 miles per hour, 4-6 hours for a full charge.	200-600 miles per hour, 30-50 minutes per charge
Location	Home garage	Home garage, on street or parking field	Commercial locations, short stops, near highways

City EV Charging Initiatives

Guiding Principles for EV Initiatives

Integrate EV efforts into City's emission reduction goals

Support development of a public-access charging network to spur EV adoption

Structure public support to maximize EV charging and minimize City's upfront capital expense

Wind down public support for charging infrastructure development as EV market matures

DC Fast Charging Stations

Concept:

- Provide fast charging coverage citywide for drivers who need to charge on the go
- Each station would have 10-20 DC fast chargers, providing an 80% charge in 30 minutes or less

Phase 1: 2018-2019

- Complete fast charging study – Q3 2018
- Implement first station – Q4 2018
- Announce 5 station strategy – Q4 2018
- Implement 5 stations – 2019

Phase 2: 2020 and beyond

- Scale up to 50 fast charging stations citywide

Level 2 On-Street Charging

Concept:

- Enable drivers who park on-street to charge by installing on-street chargers across the five boroughs
- Partnership between NYC DOT and Con Ed

Phase 1: 2018-2020

- Complete on-street charging study – Q3 2018
- Partner with Con Ed to install 100+ on-street level 2 chargers – 2019
- DOT to select sites, Con Ed to install, operate, and maintain chargers

Phase 2: 2020-beyond

- If the pilot is successful, expand L2 on-street charging to more communities

Level 2 DOT Lots and Garages

Concept:

- Enable EV owners to charge while parked at NYC DOT lots and garages
- NYPA funded in first round, now City funded with a NYSDEC rebate

Phase 1:

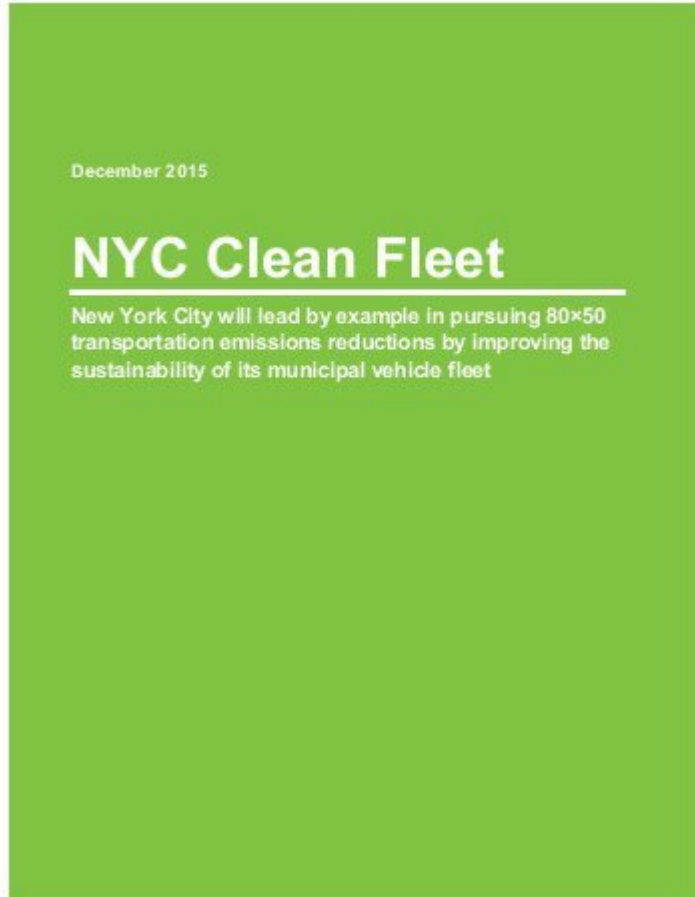
- Installed 27 L2 chargers in 8 parking facilities in 2015

Phase 2:

- Installing a second round of 14 L2 chargers in spring 2018

Clean Fleet

Clean Fleet



- **NYC Clean Fleet:** December 2015, launched the City fleet sustainability plan
- Leading by example in clean transportation; large municipal fleet in US
- **Goal:** 50% reduction in greenhouse gas emissions by 2025; 80% reduction by 2035
 - Add 2000 EV sedans to fleet by 2025
 - Increase use of biodiesel, renewable diesel and/or CNG
 - Anti-idling, start-stop, auxiliary power units, and other tech

NYC Clean Fleet – EV Initiatives

- Over 30,000 vehicles in fleet
- \$1B spent annually on fleet procurement and operations
- Goal: 2000 Evs in fleet by 2025
 - Ahead of schedule - 1000 EVs in fleet by July 2017
 - As of early 2018, 1224 EVs on road

NYC Clean Fleet – EV Initiatives

- City has 500 level 2 chargers for fleet use
- Among the chargers are 37 solar carports
- 11 will be publicly accessible
- Site assessment for fast charging upcoming

Fleet's 500 Level 2 and Solar Carports Citywide



Questions

Thank You!



Learn more about the Alliance:

www.usmayors.org/alliance-for-a-sustainable-future/

and

www.Allianceforasustainablefuture.com

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