Greater Rochester Clean Cities & Rochester EV Accelerator

Spring 2018 Regional Local Government Workshop

Agenda

- Greater Rochester Clean Cities (GRCC)
- Electricity Basics
- Vehicles
- Infrastructure
- Getting Started
- GRCC EV Projects

Images: NREL Image Gallery #14922 and #23854

2 U.S. Department of Energy

What is Clean Cities ?

- The Clean Cities Program was implemented in 1993 after passage of the Energy Policy Act of 1992(EPAct).

Purpose : Reduce US dependence on petroleum in the transportation sector

- Clean Cities is a government-industry partnership sponsored by the U.S. Department of Energy's (DOE)
- Working with its network of about 90 local coalitions and more than 18,000 stakeholders across the country, Clean Cities delivers on its mission to reduce petroleum consumption in on-road transportation.

3 U.S. Department of Energy

Greater Rochester Clean Cities

- Independent Non Profit Organization
- 150 Stakeholders
- National Clean Cities network
- Fuel-neutral

4

Portfolio of Technologies

Clean Cities focuses on a portfolio of technologies. Examples include:

- Alternative Fuel Vehicles(AFVs)
  - Electric Drive
  - Propane(LPG)
  - Natural Gas(CNG) and(LNG)
  - Renewable Natural Gas/Biomethane
- Fuel Blends
  - Ethanol (E85)
  - Biodiesel/B20 and higher blends
- Other strategies
  - Idle Reduction
  - Fuel Economy
  - Vehicle Miles Travelled (VMT) Reduction

5

Basics: Electricity as a Fuel Source

Electricity is considered an alternative fuel under the Energy Policy Act of 1992.

Electric drive vehicles use electricity from on- or off-board electrical power sources and store it in batteries.

6

Basics: Benefits and Considerations

Benefits	Considerations
• Increased energy security • Improved fuel economy • Lower fuel costs • Low or zero tailpipe emissions	• Higher initial vehicle cost • Limited infrastructure availability • Battery life • Reduced all-electric range

7

Basics: Electric Drive Vehicles

Hybrid Electric Vehicle (HEV)
- Powered by an engine and electric motor
- Does not use electric vehicle supply equipment (EVSE) to charge the battery

Plug-In Hybrid Electric Vehicle (PHEV)
- Powered by an electric motor and engine
- Uses EVSE to charge the battery

All-Electric Vehicle (EV)
- Powered by an electric motor
- Uses EVSE to charge the battery

8

Vehicles: Vehicle Availability

Light-Duty
- HEVs, PHEVs, and EVs widely available
- New models rolling out nationwide

Medium-Duty
- Variety of HEVs, PHEVs, and EVs available
- New models becoming available
- Certified conversions an option

Heavy-Duty
- Several HEV makes and models available
- Light hauling, delivery, and off-road service

9

Infrastructure: Electric Vehicle Supply Equipment (EVSE)

	Current Type	Voltage (V)	Charging Time	Primary Use
Level 1	Alternating Current (AC)	120V	2 to 5 miles of range per hour of charging	Residential
Level 2	AC	240V	10 to 20 miles of range per hour of charging	Residential Commercial
Level 3 *(Pending Industry Consensus)*	*Undefined*	*Undefined*	*Undefined*	*Undefined*
DC Fast	Direct Current (DC)	480V	60 to 80 miles of range per 20 minutes of charging	Commercial
Wireless	AC	240V	10 to 20 miles of range per hour of charging	Residential Commercial

10

Infrastructure: Connectors and Plugs

	Charging Standard
Level 1	SAE J1772 NEMA 5-15 NEMA 5-20
Level 2	SAE J1772
DC Fast	CHAdeMO SAE J1772 Combo Tesla Supercharger
Wireless	SAE J2954 *(pending)*

11

Uses: Charging at Home and in Public

Charging at Home

- Most charge vehicles overnight at home using a Level 1 outlet or installed Level 2 EVSE
- Installation requires permitting and licensed contractors

Charging in Public

- Increases vehicle range, especially for consumers who live in high-density urban areas
- Ideal public charging locations include:
  - Workplaces or office buildings
  - Shopping centers
  - City parking lots
  - Airports
  - Hotels

12

Other Considerations: Maintenance and Safety

- **HEVs and PHEVs have similar maintenance requirements** as conventional vehicles
- **EVs typically require less maintenance** than conventional vehicles:
  - Battery, motor require little to no maintenance
  - Fewer fluids to change
  - Brake wear is reduced due to regenerative braking
  - Fewer moving parts
- Electric drive vehicles **must meet the same safety standards** as conventional vehicles

13

Getting Started: PEV Handbooks

Helpful Resource:

Clean Cities PEV Handbooks are great resources for fleet managers, station owners, and individuals who are ready to start using PEVs and infrastructure.

afdc.energy.gov/publications

14

Getting Started: Questions to Ask

- What federal, state, and local incentives are available?
- What are my driving range needs?
- What type of PEV is best for me?
- How and where will my PEV be charged each day?
- What level of charging will I need?
- Are there charging stations in my area? Are they public or private? Can I visit?
- What support can my local Clean Cities coalition provide?

Helpful Resource:

The *AFDC Laws and Incentives Search* provides information about available state and federal incentives for PEVs and EVSE.

15

GRCC EV Projects-Planning

- 2011 Plug-In Vehicle Strategic Planning/Feasibility Study-prepared for US DOE
- 2012 Clean Cites EV Planning Grant-Funded by US DOE Clean Cities and NYSERDA
- 2016 Genesee Region EV Charging Station Plan

16

GRCC EV Projects-Implementation

- Workplace Charging Initiative-2015-2016
- EV Charging Station Plan Implementation Phase
  - EV stations placed in 5 communities (Brockport, Geneseo, Canandaigua, Victor and Batavia)
- Rochester EV Accelerator Project (ROC EV)

17

Agenda

- ROC EV Intro
- Why EVs?
- Program Areas
- Get involved!

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ROC EV Intro

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Who is the Rochester EV Accelerator (ROC EV)?

Electrification Coalition · ENERGETICS · City of Rochester, NY Lovely A. Warren, Mayor Rochester City Council · GRCC Greater Rochester Clean Cities

ROC EV is a forward-thinking, grassroots initiative aimed at making greater Rochester a cleaner, healthier, and more sustainable community by facilitating the widespread adoption of plug-in EVs.

NEW YORK STATE OF OPPORTUNITY. | NYSERDA

ROC EV is supported by the New York State Energy Research and Development Authority (NYSERDA) as part of the Charge NY initiative.

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What does ROC EV do?

- Raise awareness through outreach/marketing/education
- Facilitate automaker/ dealership collaboration
- Implement local EV-friendly policies
- Deploy EVs in fleet applications
- Advance workplace charging

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Why EVs?

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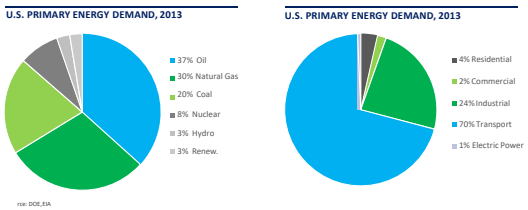
Oil Dependence

Oil provides 92 percent of transportation energy



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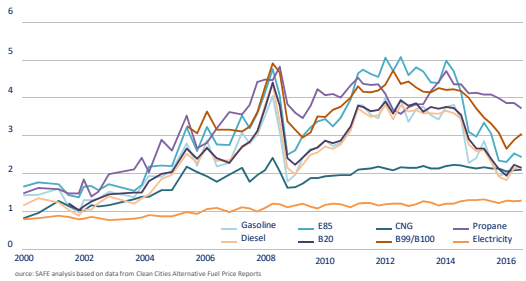
Electricity is low and stable in price



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Cleaner Electricity = Cleaner EVs

Based on data on power plant emissions released in February 2018, driving on electricity is cleaner than gasoline for most drivers in the US.

Driving on electricity in New York State is equivalent to driving a gasoline car with 191 MPG fuel economy rating.

Source

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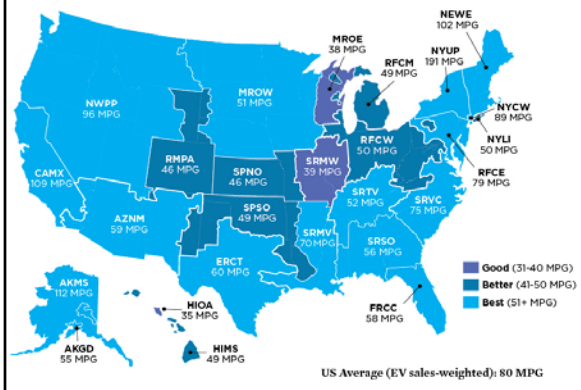

The Electric Car: An Overview

Battery Electric Vehicle (BEV)
- 100% powered by electric motor
- No gasoline
- Typical range 80-250 miles
- Refueling time varies– typically 30 minutes for DC fast charging and 4-6 hours for Level 2 charging

Plug-in Hybrid Electric Vehicle (PHEV)
- Combination of electric motor *and* gasoline engine
- Typical battery range 15-50 miles
- Range + gasoline: 350-600 miles
- Suggested Level 1 charging overnight

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Charging 101: Charging Levels and Standards

Level 1
120 V
Home Outlet

Level 2
240 V

DC Fast
Charger

Financial Incentives

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Charge NY: Drive Clean Rebate

DRIVE CLEAN REBATE FOR ELECTRIC CARS

The Drive Clean Rebate amount depends on the EPA all-electric range for that car model

Greater than 120 miles	$2,000 OFF
40 to 119 miles	$1,700 OFF
20 to 39 miles	$1,100 OFF
Less than 20 miles	$500 OFF
Electric cars with MSRP >$60,000 (MSRP is the manufacturer's suggested retail price)	$500 OFF

For more information, visit nyserda.ny.gov

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Charge NY: Benefits

- Discount tolls on NYS thruway
- Discount tolls on NYC bridges/tunnels
- Access to HOV lanes

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Federal Tax Incentive

Kia Soul EV

MSRP: $33,950
Federal Tax Credit: $7,500
State Rebate: $1,700
Total Cost: $24,750

For vehicles acquired after December 31, 2009, the credit is equal to $2,500 plus, for a vehicle which draws propulsion energy from a battery with at least 5 kilowatt hours of capacity, $417, plus an additional $417 for each kilowatt hour of battery capacity in excess of 5 kilowatt hours. The total amount of the credit allowed for a vehicle is limited to $7,500.

For more information, visit irs.gov

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Program Areas

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Consumer Education & Outreach

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Popular EV Models

Nissan LEAF
30 kWh Battery
150 miles

BMW i3, i3 REx
22 kWh Battery
72-150 miles

Chevy Bolt
60 kWh Battery
238 miles

Tesla Model 3
50-74 kWh
220-310 miles

Chevy Volt
18.4 kWh Battery
53 miles

Chrysler Pacifica
16 kWh Battery
33 miles

For a comprehensive list, visit RochesterEVs.com/consumer-vehicle-gallery

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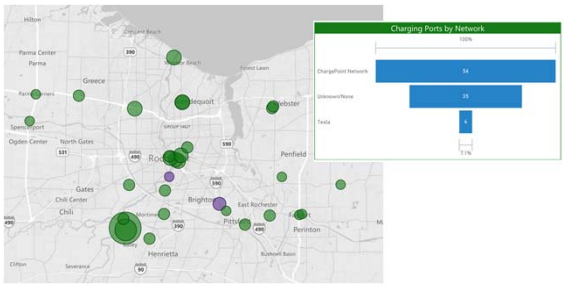
Charging Infrastructure in Rochester

There are 95 registered chargers in greater Rochester



Map and data via NYSERDA

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Workplace Charging

Offering EV charging can:

- Increase employee retention
- Help attract the best and brightest applicants
- Place your business among the region's most innovative employers, helping to create a positive brand name

Employers do not need to have charging availability already installed to join the Workplace Charging Challenge.

People with access to workplace charging are **six times** more likely to purchase an EV

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Rochester EV Accelerator *Workplace Charging Challenge Partners*

Calls on Rochester employers to help make our community a national leader in EV adoption by providing employees with EV charging stations at work.

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Group Buys

2018 Nissan Leaf
$29,990 MSRP
- $3,000 discount
- $7,500 Federal Tax Credit
- $2,000 Drive Clean Rebate
$17,490

2018 BMW i3
$42,400 MSRP
- $10,000 OEM discount
- $7,500 Federal Tax Credit
- $1,700 Drive Clean Rebate
$23,200

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Fleet Electrification

Fleet Electrification Workshop
Thursday, June 14th | 9:00 AM – 1:00 PM
I-Square, 400 Bakers Park, Rochester 14617
Registration Required

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Get Involved!

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Volunteer with Us

Event staff:
Co-pilot
Tabler
Runner

Email info@RochesterEVs.com to sign up today!

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Attend an event

Rochester Lilac Festival
Saturday, May 19th
10:30 AM – 4:30 PM

EV Enthusiast Meeting
Thursday, May 24th
6:30 PM – 8:30 PM
400 Bakers Park,
Rochester, NY 14617

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