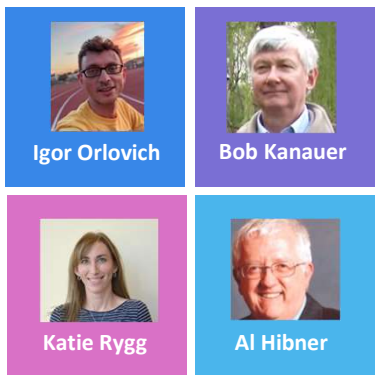


1

YOUR INSTRUCTORS - ALL ARE PENFIELD RESIDENTS WHO OWN ELECTRIC VEHICLES



Igor Orlovich
Owner of a 2018 (Now 2022) Nissan Leaf EV

Bob Kanauer
Family Owns 2 Chevy Volts - PHEVs

Katie Rygg
Owner of a 2020 Tesla Model 3 EV
Co-Founder & Co-Lead: Color Penfield Green

Al Hibner
Owner of a 2020 Chevy Bolt EV
Co-Founder: Color Penfield Green



August 11th & 19th, 2022

2

2

SESSION I – 8/11/22 – 7 PM

- INTROS, ANNOUNCEMENTS & INTRO VIDEO
- TERMINOLOGY
- WHY EVS?
- WHY ARE EVS BETTER?
- EV DOWNSIDES?
- WHAT EVS ARE AVAILABLE?
- HOW DO YOU SELECT AN EV?
- WHAT CREDITS & REBATES ARE AVAILABLE?
- EVS IN OUR AREA
- LIVING WITH AN EV DAY-TO-DAY
- FREQUENTLY ASKED QUESTIONS
- THE EV COMMUNITY - LINKS & EVENTS

SESSION II – 8/18/22 – 7 PM

- ADVANCED TOPICS
- PENFIELD RESIDENT EV STORIES-Q&A
 - IGOR ORLOVICH
 - BOB KANAUER
 - KATIE RYGG
 - AL HIBNER
- LEARN ABOUT SOME EV DEALERS
- YOUR NEXT ACTION STEP(S)
- ATTEND THE RIT EV CAR SHOW
 - SAT. - SEPTEMBER 24TH - 10 AM TO 2 PM
 - NATIONAL DRIVE ELECTRIC WEEK

SESSION AGENDAS

3

PRE CLASS SURVEY

- Before we begin this class, how likely are you to purchase an EV or PHV within the next 6-12 months? (Show of Hands)
 - **Very likely**
 - **Likely**
 - **Neither Likely nor Unlikely**
 - **Unlikely**
 - **Very Unlikely**
 - **Other (Please Explain)**

WHAT IS THE SINGLE MOST IMPORTANT TOPIC YOU WISH TO LEARN ABOUT? (Results from Jan/Feb '22 Class)

- Taking long trips – how to charge along the way.
- Which model is best for me?
- EVs on the market and how they perform.
- Exactly what is an EV vehicle?

ANNOUNCEMENTS

- We encourage you to ask questions as we present the slides.
- Please be sure to fill out the sign-in sheet so that a PDF copy of Session I & II PowerPoints can be emailed to all of you right after each session.
- We encourage you to sign up to receive the Color Penfield Green monthly newsletter if you don't already subscribe to it.

4

PRE-CLASS SURVEY (CONT): KEY EV TOPICS TO COVER (RANKED)

ANSWER CHOICES	RESPONSES
▼ Makes & models of EVs on the market right now.	100.00% 7
▼ Prices of EVs as compared with gasoline powered vehicles.	85.71% 6
▼ Rebates & tax credits available right now to reduce the price of EVs.	71.43% 5
▼ Advantages and disadvantages of EVs over gasoline powered vehicles.	85.71% 6
▼ Costs of maintenance and insurance as compared with gasoline powered vehicles.	85.71% 6
▼ Costs to charge EVs on a regular basis.	85.71% 6
▼ Costs of installing home charging equipment (Level II chargers).	85.71% 6
▼ Taking long trips with EVs - charging them along the way.	71.43% 5
▼ Personal experiences with EVs as told by Penfield residents who currently own them.	71.43% 5
▼ Seeing some EVs "up close and personal" during the course and being able to ask questions of the owners.	28.57% 2
▼ How EVs perform at different times of the year, especially during winter.	85.71% 6
▼ The differences between Plug-In Hybrid (PHEV) and 100% Battery Electric (BEV) EVs.	85.71% 6
▼ Other (please specify) Other: Battery replacement: How long do they last and what do they cost? Responses	14.29% 1
Total Respondents: 7	

5

Communities and Local Government Team at NYSERDA

Clean Energy Communities

Community Campaigns

2. Community Campaign for Electric Vehicles – 200 Points

The local government along with partner organizations and volunteers invite dealerships, platform providers, and/or other EV industry partners to offer a variety of makes and models of electric vehicles. The offer may be promoted through other outreach efforts. Vehicles must be new and purchased to qualify. Municipalities applying jurisdiction are not eligible to be counted as a customer.

Municipality Size by Population	Required Number of Campaign Participants	Action Amount
Large (40,000+)	10	\$15,000
Small/Medium (0-39,999)	5	\$5,000

NYSERDA Clean Energy Communities Scorecard

Thank you for participating in NYSERDA's Clean Energy Communities Program. This scorecard shows your community's accomplishments and how they compare to others in your region and across New York State.

Town of Penfield


Participating

36,242
POPULATION (2010 CENSUS)

45
DESIGNATED COMMUNITIES IN THE REGION

408
DESIGNATED COMMUNITIES STATEWIDE

Accomplishments



400
POINTS EARNED

ACTIONS COMPLETED	Count	Points
High Impact Actions		
Community Campaigns	1	200
Energy Code Enforcement Training	1	200
Grand Total	2	400

SUCCESS!

Leaderboard

Regional Leaders	Points
City of Canandaigua	5,300
Village of Lima	5,200
Town of Geneva	4,700
Statewide Leaders	Points
Village of Hastings-on-Hudson	7,100
Town of Bedford	6,400
City of Beacon	5,400

6

Penfield Community Choice Aggregation

CCA Programs ▾ CCA Options ▾ RFP Announcement CCA News FAQ Contact Penfield.org

<https://penfieldcca.com>

<https://penfieldcca.com/enroll-electricity/>

Community Choice Aggregation for the Town of Penfield, NY by Good Energy, LP

Members of Color Penfield Green hope that you will "Opt-Up" to our program's Penfield 100 Plan to power your current or future EV with 100% Renewable Electricity! Thank you for considering this option.

PENFIELD GREEN

PENFIELD GREEN (default product):
50% Renewable Electricity (New York EDP eligible)
\$0.05733 per kilowatt-hour (kWh) (supply portion of bill only)
You will be automatically enrolled in Penfield Green unless you select Penfield 100 or opt out of the program.

PENFIELD GREEN (default product)
5.733¢/kWh
50% Renewable Electricity

PENFIELD 100 (Opt Up product)
6.443¢/kWh
100% Renewable Electricity

The following charges apply to RG&E Supply Service and can be used to compare to ESCO offers. Contact an ESCO for their pricing offers.

Bill Issuance Charge (per bill)	\$0.93
Merchant Function Charge	Link to Statement
Supply Charge <i>(Price displayed reflects a prior 30 day average)</i>	\$0.0717023
Tax on Supply Charge	Link to Statement

Customers receiving electricity supply from an ESCO whose ESCO charges appear on their RG&E bill will receive an administrative purchase of receivables (POR) charge of \$0.000552 per kWh. This charge will expire on August 31, 2011. Please note: Local sales taxes may apply to some districts and are not included in the price estimates above.

RG&E WEBSITE - AS OF 8/10/2022
\$0.0717023/KWH - 30 DAY AVG. RATE

Supply Charge: The RG&E supply charge varies based on forecasted daily market prices. The price displayed above reflects a prior 30 day average and is not a guarantee of future market prices.

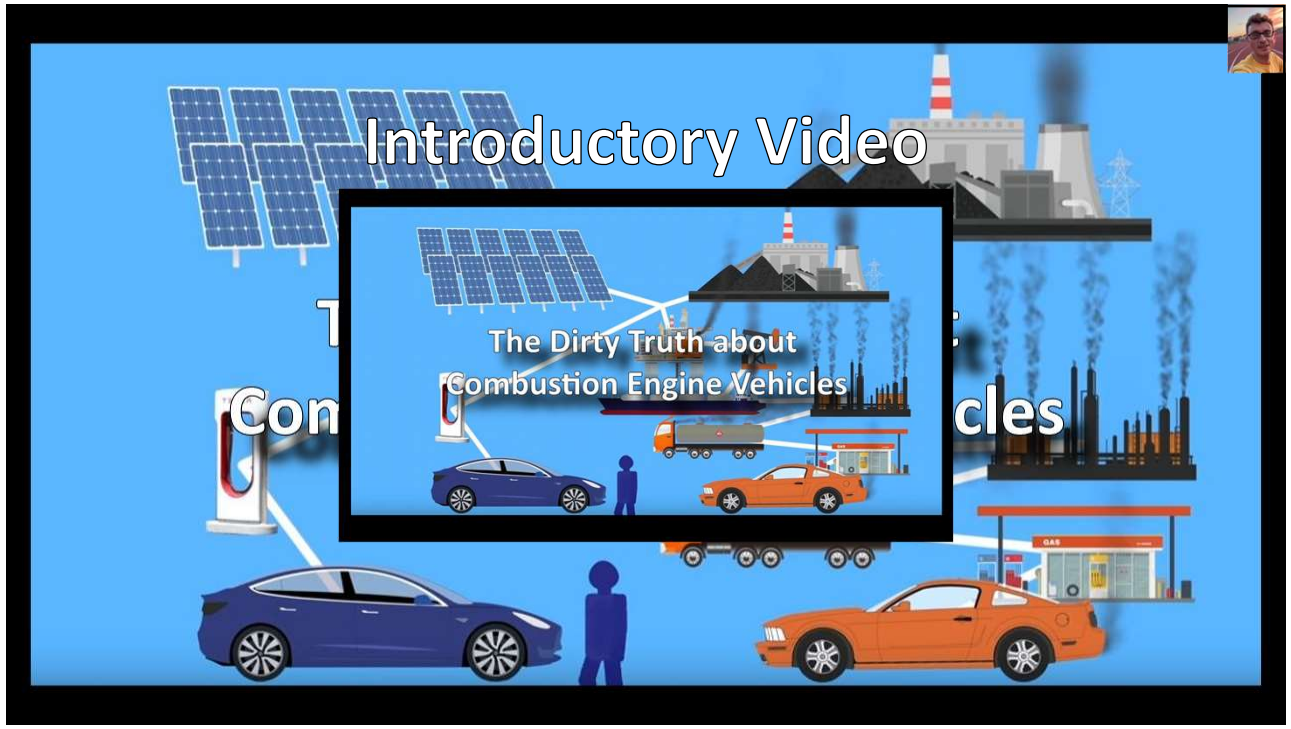
NewEnergy, directly at (833) 942-3023.

7

SESSION I

Electric Cars 101 – Your Guide to EVs
August 11th, 2022

8



9

Hybrid Electric Vehicle

TERMINOLOGY - THE TYPES OF ELECTRIC VEHICLES

The diagram shows a white car with a cutaway view of its engine compartment. Various components are labeled with lines pointing to them: Exhaust System, Internal combustion engine (spark ignited), Power Electronics Controller, DC/DC Converter, Thermal System (cooling), Fuel Filler, Fuel Tank (gasoline), Traction Battery Pack, Electric Traction Motor, Electric Generator, Transmission, and Battery (auxiliary). The car has "HYBRID-ELECTRIC" written on its side.

HEV - Hybrid Electric Vehicles

- HEV (aka Hybrid Electric Vehicle) has gas engine and one or more electric motors plus a battery to capture energy when car is slowing down.
- That energy is later used to help move the car along with gas engine.
- Mainly used to improve mileage.
- Usually very limited EV only operation- 1 mile or so.
- No tax credits/rebates available.

afdc.energy.gov

10

Plug-in Hybrid Electric Vehicle

TERMINOLOGY - THE TYPES OF ELECTRIC VEHICLES

Internal combustion engine (spark ignited)
 Power Electronics Controller
 DC/DC Converter
 Thermal System (cooling)
 Fuel Filler
 Fuel Tank (gasoline)
 Traction Battery Pack
 Electric Traction Motor
 Electric Generator
 Transmission
 Onboard Charger
 Battery (auxiliary)

PHEV – Plug-in Hybrid Electric Vehicles

- PHEV (aka Plug-in Hybrid) is a hybrid with a larger battery that can also be charged by plugging it in.
- Can go some distance in pure EV mode, typically 20-40 miles.
- After the battery is drained it becomes a regular hybrid until recharged again.
- Eligible for tax credits and rebates, depending on MSRP, range and battery size.

11

All-Electric Vehicle

TERMINOLOGY - THE TYPES OF ELECTRIC VEHICLES

Electric Traction Motor
 Power Electronics Controller
 DC/DC Converter
 Thermal System (cooling)
 Charge Port
 Transmission
 Onboard Charger
 Battery (auxiliary)
 Traction Battery Pack

BEV – (Purely) Battery Electric Car

- BEV - Purely battery electric car with no combustion engine.
- Eligible for tax credits and rebates, depending on MSRP, range and battery size.

12




WHY EVS?

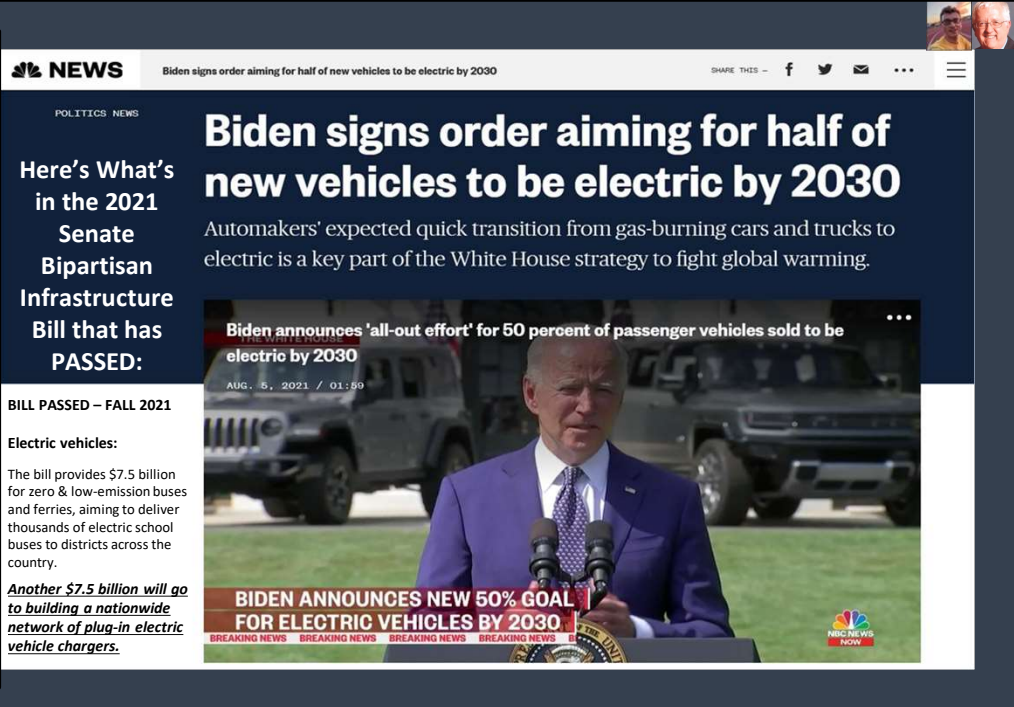
- Next step in the evolution of cars.
- Superior to combustion vehicles in most regards.
- Minimize air pollution and contribution to climate change.
- Gas and diesel cars are going away (starting to get banned across the globe by cities, states and countries).
- Automakers are stopping development of new internal combustion engines (ICE) and retooling for EVs instead.
- Resale value of ICE cars is already collapsing in Europe and US will follow.
- Bans so far: Europe- 2025-2040, Canada 2035, some US states 2030-2035.

IT'S THE FUTURE

13

WHY EVS?

WHY SHOULD YOU BE THINKING ABOUT BUYING AN ELECTRIC VEHICLE?



WHY EVS?

WHY SHOULD YOU BE THINKING ABOUT BUYING AN ELECTRIC VEHICLE?

Here's What's in the 2021 Senate Bipartisan Infrastructure Bill that has PASSED:

BILL PASSED – FALL 2021

Electric vehicles:
The bill provides \$7.5 billion for zero & low-emission buses and ferries, aiming to deliver thousands of electric school buses to districts across the country.

Another \$7.5 billion will go to building a nationwide network of plug-in electric vehicle chargers.

BIDEN ANNOUNCES NEW 50% GOAL FOR ELECTRIC VEHICLES BY 2030

14

WHY EVS?
WHY SHOULD YOU BE THINKING ABOUT BUYING AN ELECTRIC VEHICLE?

What's in the Inflation Reduction Act (Just Passed by the Senate – 8/7/2022) on Climate? For EV's? ...Tons!

- ~\$385 billion – by far the largest-ever federal climate package
- \$15 billion in EV tax credits: \$7,500 for new, \$4,000 for used
 - Max individual income: \$150k for new, \$75k for used
 - Max EV price: \$80k for new SUVs/pickups/vans, \$55k for new cars, \$25k for used
 - 50–100% of battery components & minerals must be from US or free trade partner
- ~\$150 billion in clean electricity production & investment tax credits
 - Very important! Renewable energy deployment had been stalling a bit

15

WHY EVS?
WHY SHOULD YOU BE THINKING ABOUT BUYING AN ELECTRIC VEHICLE?

What's in the Inflation Reduction Act (Just Passed by the Senate – 8/7/2022) on Climate? For EV's? ...Tons!

- ~\$60 billion for domestic clean energy manufacturing
 - \$40B tax credits for US solar, wind, batteries, EVs, and critical minerals
 - Up to \$20B in loans to build EV manufacturing facilities
 - \$2B to retool car plants to make EVs
 - \$2B to National Labs to accelerate breakthrough energy research
 - \$500 million for the Defense Production Act
- \$250 billion in loan authority to the Department of Energy for lending to new green companies/technologies

16

**WHY EVS?
WHY SHOULD YOU BE THINKING ABOUT BUYING AN ELECTRIC VEHICLE?**



What's in the Inflation Reduction Act (Just Passed by the Senate - 8/7/2022) on Climate? For EV's? ...Tons!

Posted by u/thepick1 16 hours ago

Detailed Look At Bill Written By a Lawyer

I didn't see this posted here yet. This is taken from user Nadrealista over at wwidtalk.com

A Deeper Dive Into the Bill With Igor...

New Vehicle Credit


1. Manufacturer caps eliminated. (Page 370, line 15)
2. Credit applies for vehicles purchased beginning January 1, 2023. (Page 386, line 1).
3. Transition provision for EVs with written sales orders dated in 2022 prior to the date of President signing the bill but delivered in 2023 allows purchaser to claim the "old" credit in 2023. (Page 386, line 20). *I am not positive why Mr. Stidham said sales order instead of binding contract. Bill is clear on this fact.*
4. Vehicle must be assembled in North America to qualify for new credit. (Page 366, line 15).
5. North American assembly requirement applies to vehicles sold after the date of adoption of the bill. (Page 386, line 3)

Created Sep 24, 2020


Join

Back to Top

17



WHY EVS?



COST OF FUELING

- Gas prices are very volatile and depend on global factors.
- Electricity prices are regulated and much more stable.
- You can even make your own electricity using solar system if desired.
- Charging at home is cheap and convenient.
 - It takes a few seconds to plug in.
 - Car charges while you go on with your day or night (think cell phone charging).
 - Car can preheat itself for your morning commute while plugged in.
 - Charging can be scheduled for when electricity is cheapest.

18

Presented by Color Penfield Green

Page: 9




Table 2.1. Estimated Per-Mile Repair and Maintenance Costs by Powertrain

Powertrain Type	0-50K Miles	50K-100K Miles	100K-200K Miles	Lifetime Average
BEV	\$0.012	\$0.028	\$0.043 ⁷	\$0.031
PHEV	\$0.021	\$0.031	\$0.033 ⁵	\$0.030
ICE	\$0.028	\$0.060	\$0.079	\$0.061


WHY EVS? COST OF OWNERSHIP

Table 2.2. Lifetime Maintenance Costs by Powertrain

Powertrain Type	Lifetime Maintenance and Repair Cost	Lifetime Savings vs. ICE
ICE	\$9,200	
BEV	\$4,600	\$4,600
PHEV	\$4,600	\$4,600

<https://advocacy.consumerreports.org/wp-content/uploads/2020/09/Maintenance-Cost-White-Paper-9.24.20-1.pdf>

19



WHY ARE EVS BETTER?

LIVING WITH ELECTRIC CARS

- Fun and comfortable to drive; fast, full torque from stop, very quiet (luxury car quiet).
- Many have one pedal driving.
- Can preheat or pre-cool in closed garage or in remote parking.
- Better weight distribution, faster traction control and winter driving.
- More space inside vs similarly sized gas cars (usually one size up for dedicated EVs).
- Don't have to deal with smelly and dirty gas stations in foul weather.
- Some models can power jobsite or house/appliances.

20

WHY ARE EVS BETTER?

SAFETY OF ELECTRIC CARS

- No engine in front = Large crumple zones.
- Heavy rigid battery low between wheels for good stability and low rollover risk.
- EVs are typically heavier, faring better in crash.
- Advanced crash prevention systems.
- Most current EVs on dedicated platforms get top scores in crash test (IIHS/NHTSA/NCAP).
- Injury claims for electric cars are 40 percent lower than for identical gas-powered vehicles (IIHS). https://www.iihs.org/media/ca2618fc-c875-4246-8a9f-5977f3b702f6/Ewxm_A/HLDI_Research/Bulletins/hldi_bulletin_37-25.pdf

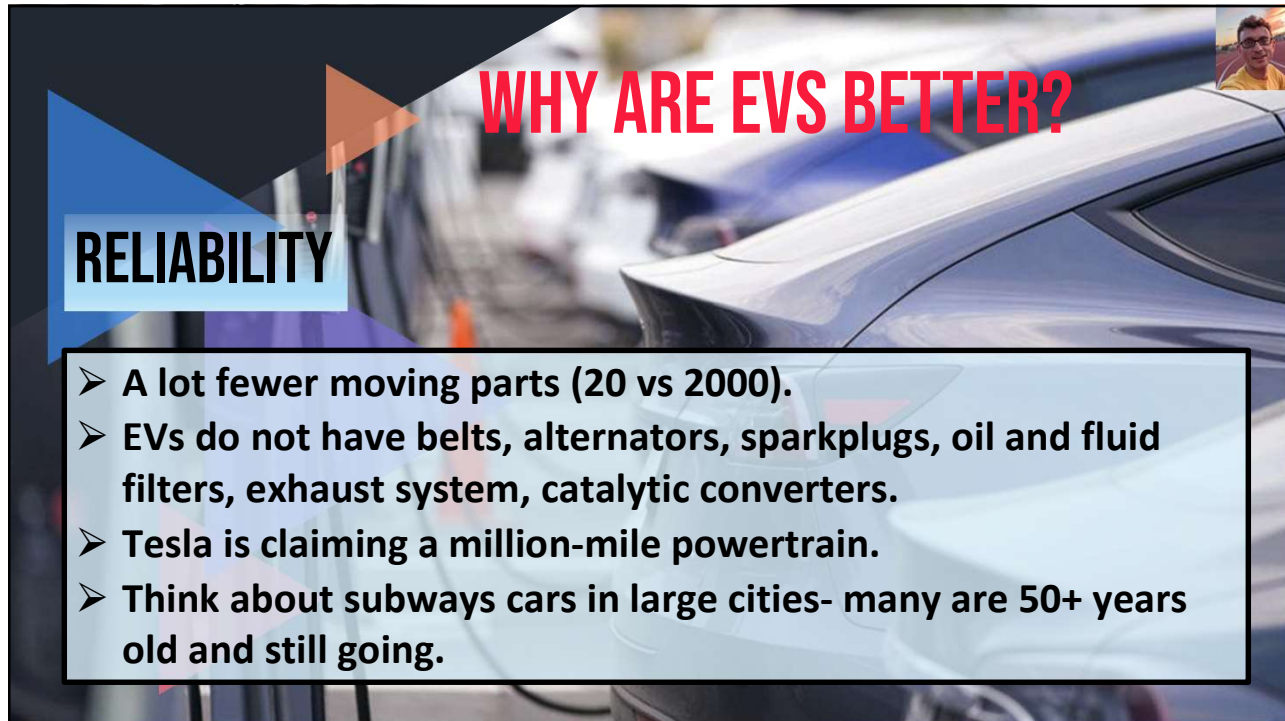
21

WHY ARE EVS BETTER?

REDUCED MAINTENANCE

- Minimal scheduled maintenance.
- Most cars just need inspections, cabin air filter, washer fluid, tires and wipers.
- NYS inspection is half off (no emissions part).
- Brakes last forever, though they do need cleaning.
- No oil or transmission fluid changes.
- Minimal brake dust, wheels stay cleaner.

22

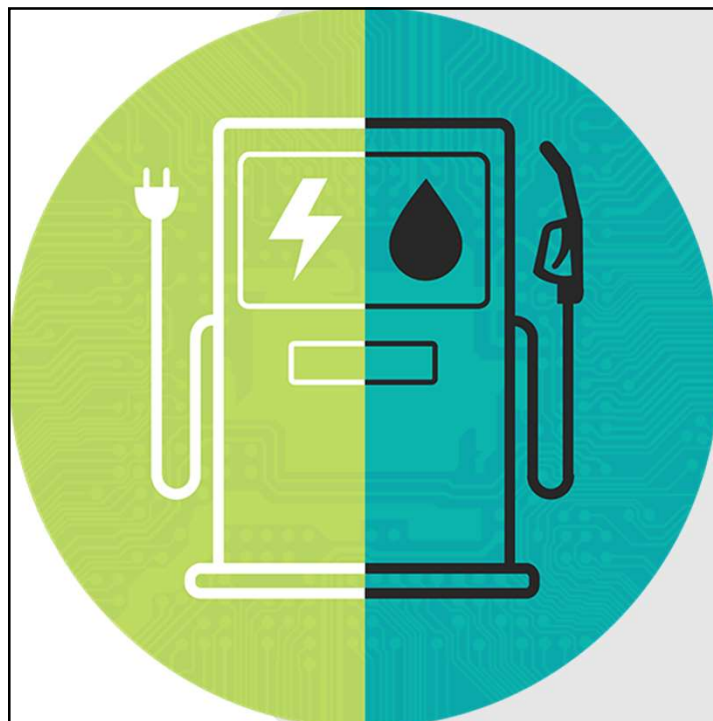


WHY ARE EVS BETTER?

RELIABILITY

- A lot fewer moving parts (20 vs 2000).
- EVs do not have belts, alternators, sparkplugs, oil and fluid filters, exhaust system, catalytic converters.
- Tesla is claiming a million-mile powertrain.
- Think about subways cars in large cities- many are 50+ years old and still going.

23



EV DOWNSIDES?

- You will not have any idea what gas costs.
- You may not see your dealer as often as you used to.
- Vehicle choices are still a bit limited but getting better.
- Dealers are not yet well trained and often unfriendly to EVs due to low service revenue.
- No engine means no waste heat:
 - Heating cabin takes battery energy, affecting range.
 - Snow will stay on the hood unless cleared.
- Long distance travel requires some planning (A bit easier in a Tesla).

24



25

WHAT EVS ARE AVAILABLE NOW AND SOON

- **PHEVs (37):** Most automakers offer one or more Plug-in hybrid models:
 - Audi, BMW, Chrysler, Ford, Jeep, Lincoln, KIA, Hyundai, Subaru, Toyota, Volvo.
- **BEVs (53):** Hatchbacks, Sedans, Luxury Cars, SUVs, Trucks, Crossovers, Motorcycles.
- **BEVs Coming Soon:** Pickup Trucks, Large SUVs.
- **Some Names:**
 - **2021:** Hyundai Ioniq5, Nissan Ariya, GMC Hummer, Rivian R1T.
 - **2022:** BMW iX and i4, Ford F150 Lightning, Jeep Wrangler Magneto EV, KIA EV6, Subaru Solterra, Toyota BZ4X, Volvo C40.
 - **2023:** Chevrolet Silverado, Chevrolet Equinox, Chevrolet Blazer, RAM 1500 EV, VW ID Buzz.

26

Model	Due at Signing	est. Lease Payment	Electric Range (miles)	Total Range (miles)
Ford Mustang Mach E Premium	\$825	\$372	230	-
Ford Mustang Mach E California Rt. 1	\$6,153	\$402	305	-
Jeep Wrangler 4xe	\$6,087	\$442	22	370
Toyota RAV4 Prime	\$267	\$409	34	600
Volvo S60 Recharge	\$6,038	\$412	22	510
Lincoln Corsair Grand Touring	\$6,295	\$442	28	430

HOW DO YOU SELECT AN EV?

By Type and Range - See Cars Selector at:
<https://plugstar.com/cars?zip=14526>

- EV vs PHEV.
- Main or second car?
- Daily commute, size and cargo capacity, towing requirements.
- Ability to plug in at home or work.
- Long distance travel frequency.

27

Federal tax credit for EVs:

<https://www.fueleconomy.gov/feg/taxevb.shtml>

WHAT CREDITS & REBATES ARE AVAILABLE NOW?

- Up to \$7500 right now. IRA bill changes this.
- Tax credit- requires having enough tax liability, cannot be carried over to next year.
- Amount depends on battery size - only PHEVs and BEVs are eligible. Regular hybrids are not.
- Each manufacturer gets 200k sales before phaseout (GM and Tesla have no credits left).
- Federal tax credit for charger:
<https://www.irs.gov/pub/irs-pdf/i8911.pdf>
- 30% (up to \$1000) for a charger and installation.
- **Inflation Reduction Act** (when passed in House & signed by President Biden) changes will bring incentives for used EVs, as well as additional funds & credits for US and Union built vehicles.

28

Drive Clean Rebate:

<https://www.nyscrda.ny.gov/all-programs/programs/drive-clean-rebate/how-it-works>



WHAT CREDITS & REBATES ARE AVAILABLE NOW?

- Rebate is taken at dealer during sale.
- Not a tax credit.
- Amount depends on EV range and MSRP.

DRIVE CLEAN REBATES FOR ELECTRIC CARS PURCHASED AFTER JUNE 30, 2021

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

Greater than 200 miles	\$2,000 OFF
40 to 199 miles	\$1,000 OFF
Less than 40 miles	\$500 OFF
Electric cars with MSRP >\$42,000 (MSRP is the manufacturer's suggested retail price)	\$500 OFF


29

EVS IN OUR AREA

Monroe County - DMV registration data (out of 480k cars registered)

<https://www.nyscrda.ny.gov/All-Programs/Programs/ChargeNY/Support-Electric/Map-of-EV-Registrations>

(NOTE: Unable to update this data to 7/1/2022 – website would not display)



Year	Registrations
2012	211
2013	235
2014	192
2015	228
2016	427
2017	686
2018	376
2019	345
2020	429
2021	1,071
2022	1,172

Key Metrics

- 3.23 BEVs per 1k People
- 3.72 PHEVs per 1k People
- 479.60 BEVs per DCFC Location
- 12.93 EVs per Level 2 Port

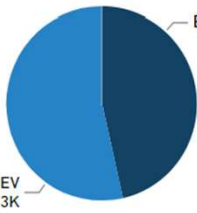
EVs on the Road

5,161

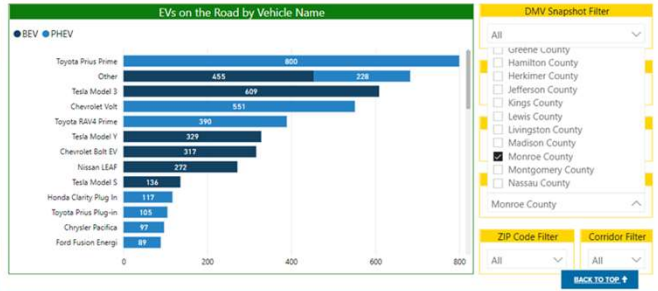
Last Updated

DATA.NY.GOV (4/1/2022)

EVs on the Road by Technology



BEV 2K
PHEV 3K



EVs on the Road by Vehicle Name

Vehicle Name	Count
Toyota Prius Prime	800
Citrix	455
Tesla Model S	609
Chevrolet Volt	551
Toyota RAV4 Prime	390
Tesla Model Y	329
Chevrolet Bolt EV	317
Nissan LEAF	272
Tesla Model 3	136
Honda Clarity Plug In	117
Toyota Prius Plug-in	105
Chrysler Pacifica	92
Ford Fusion Energy	81

30

EVS IN OUR AREA

<https://www.nyserda.ny.gov/All-Programs/Programs/Drive-Clean-Rebate/Rebate-Data/Rebate-Stats>

(NOTE: Unable to update this data to 7/1/2022 – website would not display)

Click Charts or Dropdowns to Filter

County:

Zip Code:

Application Received Date: From Date To Date

Rebates by Make and Model		
Toyota	Prius Prime	893
	RAV4 Prime	404
Chevrolet	Volt	432
	Bolt	423
Tesla	Model 3	390
	Model Y	294
	Model X	42
	Model S	35
Hyundai	Kona Electric	207
	Ionic Plug-In Hy..	77
	Ionic_Electric	51
	Hyundai Ioniq 5	22
	Santa Fe	16
	Tucson	9
	Sonata Plug-in	3
Nissan	LEAF	223

Rebates by Dealer		
Tesla Motors New York LLC		761
Hoselton Toyota Scion		575
Dorschel Toyota		325
Bob Johnson Chevrolet		292
Hoselton Chevrolet, Inc.		229
Vision Hyundai		121
Hoselton Nissan Inc		115
Vision Hyundai Of Webster		114
Bob Johnson Toyota		112
O'Connor Chevrolet, Inc.		106
Dorschel Kia		99
Vanderstynne Toyota		99
West Herr Toyota of Rochester		92
Van Bortel Chevrolet, Inc.		86
BMW of Rochester		79
Dorschel Nissan		61

Rebates by \$ Amount

Rebates by Purchase or Lease

31

Plug In America **EV CHARGING 101**
THE GUIDE TO FUELING ELECTRIC CARS

LEVEL 1 STANDARD OUTLET

- Connector provided with every EV
- Plug into a standard **120V wall outlet**
- Great for overnight or workplace charging
- Ideal for roundtrip commutes **under 40 miles**

4 miles per hour

LEVEL 2 240 VOLT OUTLET

- Provides a full charge for most vehicles in:
 - Pure Electric: 4-8 hours**
 - Electric/Gas: 2 hours or less**
- Available at both home and public stations

25 miles per hour

DC FAST CHARGE

- Faster charge rates at commercial locations:
 - CCS Combo: 65 miles** in 20 mins
 - CHAdeMO: 67 miles** in 30 mins
 - Tesla Supercharger: 130 miles** in 20 mins
- Various network providers throughout the U.S.

200 miles in 1-2 hours

Times listed are approximate. Charge time will vary depending on vehicle remaining range and station power.

For more info visit: www.pluginamerica.org

LIVING WITH AN EV DAY-TO-DAY

Charging at Home and on the Road

<https://plugstar.com/chargers>

Level 1
120V

Level 2
240V

Level 3
480V
DC Fast Charger

* Estimated. Actual charge times may vary.

32



33

FREQUENTLY ASKED QUESTIONS

How do they compare to ICE cars in price?	How long will the battery last? What's the warranty?	How far do they go?	What happens to the battery at the end of life?	Can I take them through a car wash?	Can they drive in snow?
But I need an All Wheel Drive!	Where do I charge? I don't see EV car chargers anywhere!	What about the energy used to charge, aren't we burning coal?	Can I charge using a 120V outlet or do I need 220V?	Charging from empty takes too long!	Can I get an EV SUV? What about an EV truck?
Can they tow?	Will my bill go up?		What about hydrogen cars? (FCEVs)		

January 20th & 27th, 2022 34

34



THE EV COMMUNITY LINKS AND EVENTS



Plugshare for Locating Chargers: <https://www.plugshare.com>

Plugstar Car Selection Wizard: <https://plugstar.com>

Plugin America - Guide to Fueling Electric Cars – PDF Document:

https://s3-us-west-1.amazonaws.com/zappyassets/img/custom/plugstar/PIA_EV_Charging_101_Final.pdf

Consumer Reports – EV Ownership Costs – Maintenance – PDF Document:
<https://advocacy.consumerreports.org/wp-content/uploads/2020/09/Maintenance-Cost-White-Paper-9.24.20-1.pdf>

Road trip planning: www.abetterrouteplanner.com

Local groups:

- TOCNYS (Tesla Owners Club of NYS) www.tocnys.org
- New York State Electric Auto Association
- Color Your Community Green (CPG/CFG/CBG)
<https://www.colorpenfieldgreen.org> , <https://www.colorfairportgreen.org>
- FB groups- WNY Drive Electric, CNY Drive Electric, Central NY Pure EV Driver

Upcoming Events:

- RIT EV Car Show – National Drive Electric Week – 9/24/2022 – 10 AM to 2 PM @ RIT
- Register to attend here: <https://driveelectricweek.org/event?eventid=3331> Walk-ins Welcome!
- Local Business – EV Charge Solutions: <https://www.evchargesolutions.com/>

35

ROCHESTER'S LARGEST ELECTRIC CAR SHOW
National Drive Electric Week™

DRIVE ELECTRIC

Saturday
SEPTEMBER 24TH

Get behind the wheel
Connect with local sustainability organizations

Talk with EV owners
Families welcome

10AM - 2PM
RIT
1 LOMB MEMORIAL DRIVE
ROCHESTER NY 14623

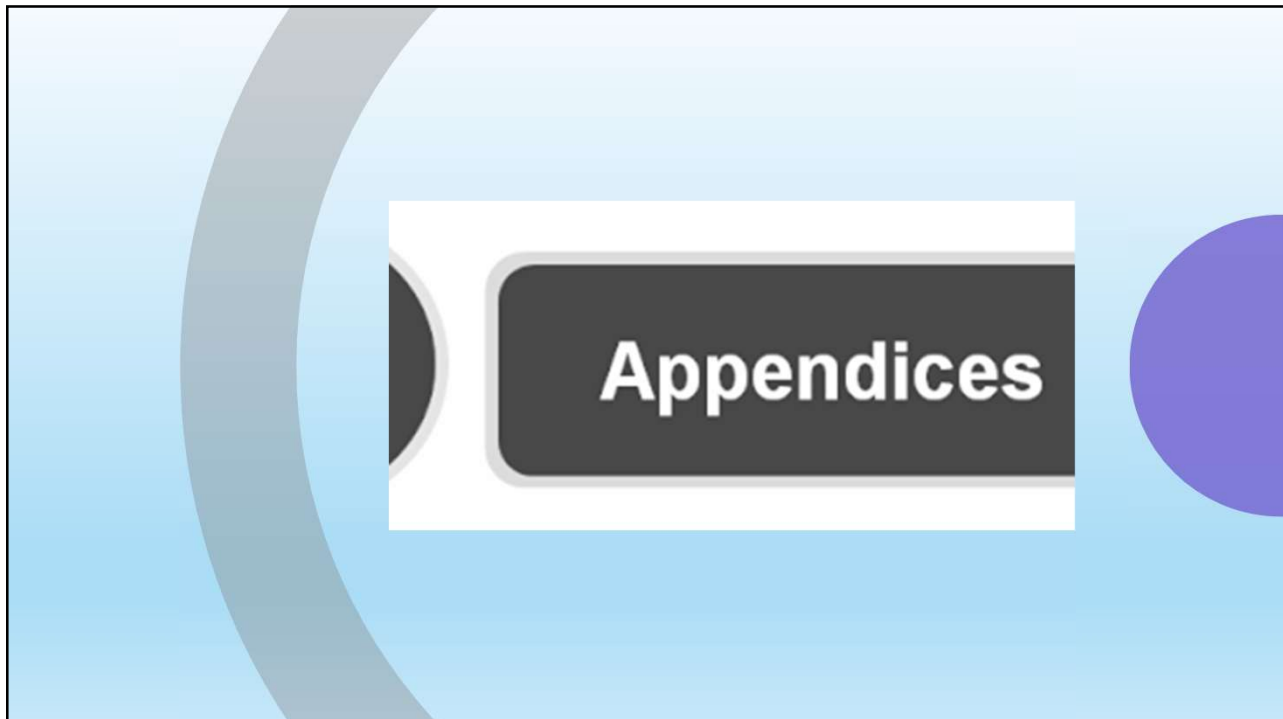
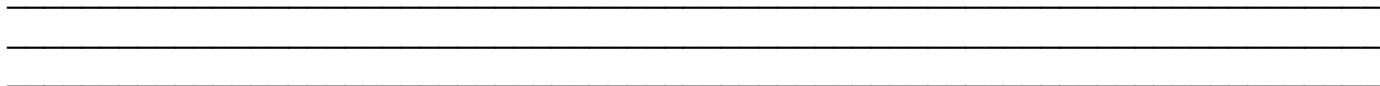
Register to attend or participate

DriveElectricWeek.org/event?eventid=3331
walk-ins welcome

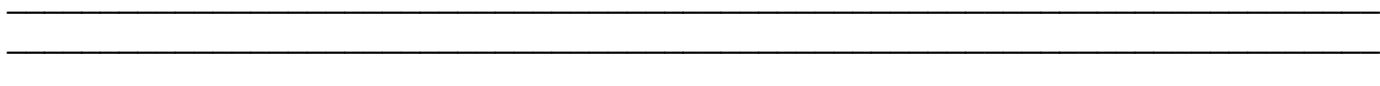
36

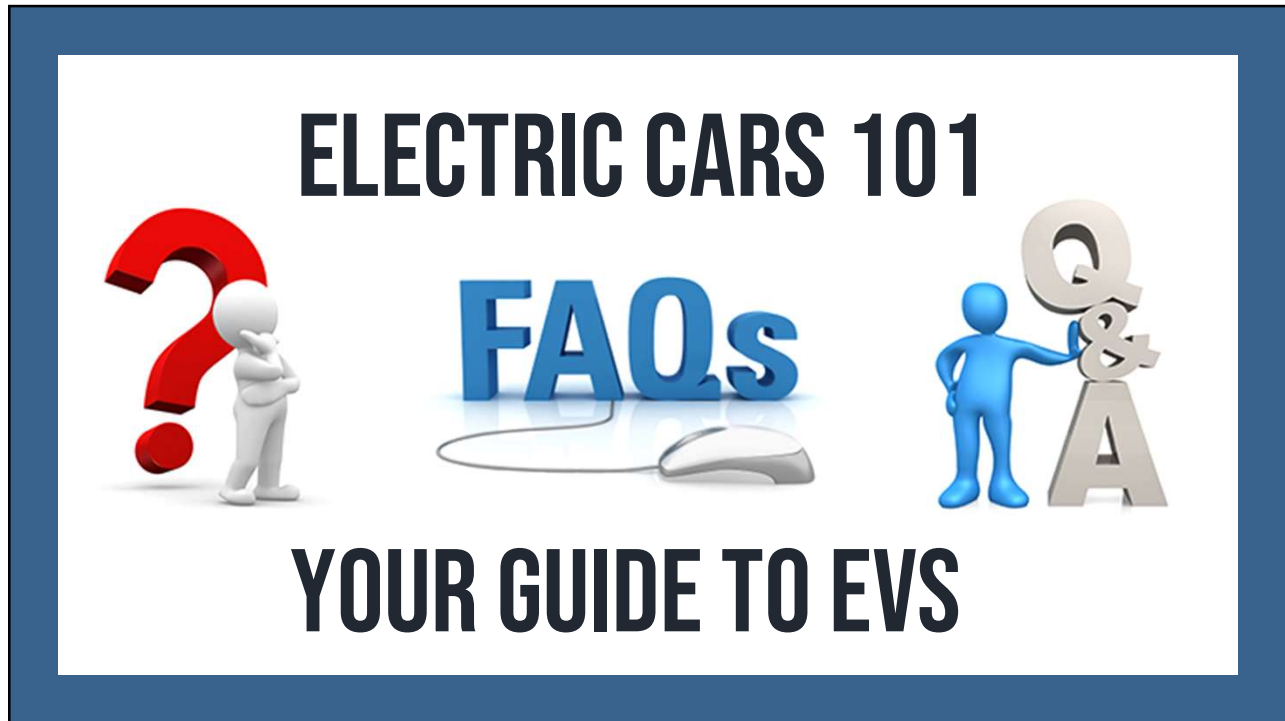


37



38





39

FREQUENTLY ASKED QUESTIONS GENERAL

<p>How do they compare to ICE cars in price?</p>	<p>Initial price may be higher at the moment compared to a similarly sized gas car. Various incentives up to \$10k help bring that down (Nissan Leaf as an example can be under \$19k). Cost of ownership is very favorable.</p>	<p>How far do they go?</p>	<p>Most PHEVs can do 20-40 miles in pure EV mode before switching back to hybrid mode. Most modern EVs are good for 150-300 miles on a single charge depending on battery size, car's size, efficiency and weather.</p>
<p>How long will the battery last? What's the warranty?</p>	<p>Cars sold in USA must have 8 years 100k miles warranty on battery per federal law. Some brands have <u>longer</u> warranty. Typically 70%-80% of total battery capacity is guaranteed to still be there at the end of warranty period.</p>	<p>What happens to the battery at the end of life?</p>	<p>Many get used in stationary grid storage as they still have a lot of useful life remaining. After that it gets returned to manufacturer and recycled. It is cheaper to reuse materials than to mine them, especially with rising global demand and shortages. There is even one battery recovery plant locally, Li-Cycle at Kodak Park. It will have capacity of 120k vehicle battery packs when completed.</p>

January 20th & 27th, 2022 40

40

FREQUENTLY ASKED QUESTIONS

GENERAL

Can I take them through a car wash?

Of course! The battery and electrical connections are fully sealed, isolated from the car body and constantly monitored by the car. Any leakage detected causes high voltage circuits to be turned off and disconnected. In addition EVs do not have exhaust or air intakes like gas cars so they are actually less sensitive to water. The hardest thing with EVs in carwash is knowing how to get the car in Neutral and turn off various automatic things like wipers.

Can they drive in snow?

EVS are very good in snow, as long as they get proper winter tires. Typical Low rolling Resistance tires they come with are not very good in snow on the other hand.

But I need an All Wheel Drive!

Many EVs today offer AWD, though in practice an EV with good winter tires is good in winter whether it's a FWD or RWD, thanks to near perfect weight distribution. In gas RWD cars, the engine is not over the wheels creating problems.

Can I get an EV SUV? What about an EV truck?

Yes, the choices are expanding every year. Mustang Mach E, Tesla Model Y, Tesla Model X, Toyota Rav4 Primer are some examples. Trucks include Ford F150 Lightning, Chevy Silverado, RAM 1500 EV.

Can they tow?

Some can- See Tesla Model Y, Model X, VW ID4, Ford F150 Lightning as an example.

January 20th & 27th, 2022

41

41

FREQUENTLY ASKED QUESTIONS

GENERAL

What about hydrogen cars? (FCEVs)



Despite fast refill and longer range, hydrogen Fuel Cell Electric Vehicle cars (FCEVs) are still not a very good option at this time:

- It's very inefficient to first spend energy generating, compressing and storing hydrogen, to pump it into a tank, then use fuel cells to generate electricity that charges a battery that drives the motor. It is simpler and cheaper to simply store that energy in a battery.
- Filling stations are very rare and exceedingly expensive (close to \$1 million each vs \$500 for Level 2 EV charger, or \$50k for a high speed commercial unit)
- Even in California, less than half of the stations are operational (from 45 total).
- Unlike BEVs, one can't just charge at the nearest wall outlet.
- Most hydrogen is produced from fossil fuels at this stage, though it could also be made using excess renewable energy.
- Good uses for hydrogen: large ships/ferries, trucks with known routes and refill stations at the depots, energy storage in areas with excessive renewable generation. See island of Orkney in Scotland for example.

January 20th & 27th, 2022

42

42

FREQUENTLY ASKED QUESTIONS CHARGING

What about the energy used to charge, aren't we burning coal?

Not much in NYS and less and less every year as the grid is getting greener. Hydro (22%), nuclear (33%), natural gas (37%) and renewables are the bulk of our mix. Or you can get solar on your house and drive on sunshine!

Can I charge using a 120V outlet or do I need 220V?

Maybe. It depends on how much you drive, how big the car's battery is and how fast do you need to recharge. A typical 20-30 mile commute is manageable with overnight charger on 120V.

Charging from empty takes too long!

Charge time depends on charger power, but in typical use it's extremely rare to charge from empty since most people commute 20-40 miles a day.

Where do I charge? I don't see EV car chargers anywhere!

At home! Most people use home charging 90% of the time or more as it's cheap and most convenient. You mainly need chargers for travel and they are growing. See Plugshare for locations.

Will my bill go up?

Assuming 1k miles/mo, 14 cents/kWh and about 3.5 kWh/mile, and about 85% overall efficiency, 335kWh a month or about \$47. A 25mpg gas car will need 40 gallons of gas at whatever price it's at today (if around \$3, or \$120). Gas would have be \$1/gallon or cars need to be much more efficient (62mpg) to compete with EVs.

January 20th & 27th, 2022 43

43

ELECTRIC CARS 101 YOUR GUIDE TO EVS

ColorPenfieldGreen.org

44