

# HVRC's Guide to PHEVs & BEVs in NY

[http://hudsonvalleyregionalcouncil.org/ev\\_guide](http://hudsonvalleyregionalcouncil.org/ev_guide) (March 21, 2019)

## Battery Electric Vehicles (BEVs)

- ▶ BEVs/EVs have no gasoline engine
  - 3x more efficient than gasoline cars, 100+ MPGe normal
  - no: oil changes, spark plugs, transmission, etc.
  - longer lasting regenerative brakes

## Funding/Grants in N.Y.

### **cars** Drive Clean Rebate - Point of Sale

- > 120 mi all-electric range \$2000 off
- 40-119 mi all-electric range \$1700 off
- 20-39 mi all-electric range \$1100 off

### **cars** DEC's ZEV rebate

- 10-50 mi. electric range \$2,500 per vehicle
- 50+ mi. electric range \$5,000 per vehicle

**trucks** Class 3-8 NY Truck Voucher Incentive Program closed, re-opens Q1 2019

## Cost Savings - Light Duty

- ▶ Switch to BEV saves \$1,061/year in NY
- ▶ L.A. estimates BEV save \$0.16/mile
- ▶ NYC's BEV Focus saves \$1418.93/year vs. gas

## Plug-in Hybrid Electric Vehicles (PHEV)

- ▶ have both an electric motor & a gasoline engine
  - still requires oil changes, emissions checks, etc.
  - longer lasting regenerative brakes
  - much better mileage (MPG) than conventional vehicles

## GHG Emissions

### ▶ CO<sub>2</sub>/mile comparison for sedans:

- BEV 0.17 lbs
- PHEV 0.39 lbs
- ICE - regular car 0.96 lbs

### ▶ Garbage Truck GHG reductions in Metric Tons/yr

- CO<sub>2</sub> 72
- NO<sub>x</sub> -0.0237
- PM10 -0.0010

## Municipalities Using BEVs & PHEVs

- ▶ Town of Bethel, NY - Smart Fortwo BEV
- ▶ Chula Vista, CA - 12 Ionics & 3 Bolts
- ▶ Hyattsville, MD **Police**: Bolt
- ▶ BEV Transfer Station Truck in Chatauqua County
- ▶ Garbage Trucks
  - Motiv Power Systems: Chicago, L.A. & Sacramento
  - BYD: Palo Alto, CA saves 6,000 gallons/yr

## BEV Sedans

## MSRP

### > 200 mile range

- ▶ Hyundai Kona (258mi) \$36,450
- ▶ Kia Niro (239mi) < \$38,000
- ▶ Tesla Model 3 (260mi) \$46,000
- ▶ Chevy Bolt (238mi) \$36,620

### 100 - 200 mile range

- ▶ Nissan Leaf (150mi) \$29,990
- ▶ VW e-Golf (125mi) \$30,495
- ▶ Hyundai Ioniq (124mi) \$29,500
- ▶ Ford Focus (115mi) \$29,120
- ▶ BMW i3 (153mi) \$44,450
- ▶ Kia Soul (111mi) \$33,950

### <100 mile range

- ▶ Honda Clarity (89mi) \$37,495
- ▶ Smart Fortwo (58mi) \$23,900

## PHEV Vehicles

## MSRP

### > 50 mile range

- ▶ BMW i3 REX (200mi) \$48,300
- ▶ Chevy Volt (53mi) \$33,520

### 20-50 mile range

- ▶ Honda Clarity (47mi) \$33,400
- ▶ Chrysler Pacifica **Minivan** (33mi) \$39,995
- ▶ Hyundai Ioniq (29mi) \$25,350
- ▶ Kia Optima (29mi) \$35,210
- ▶ Hyundai Sonata (27mi) \$34,600
- ▶ Kia Niro (26mi) \$27,900
- ▶ Toyota Prius Prime (25mi) \$27,300
- ▶ Ford Fusion Energi (22mi) \$31,400
- ▶ Mitsubishi Outlander **SUV** (22mi) \$34,595
- ▶ Ford SSV **Police** (21mi) \$34,595

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## BEV Transit Buses [seating capacity] Range

- ▶ **Proterra (330- 440kWh)** up to 350mi
  - Catalyst 35ft [28] 193-251mi
  - Catalyst 40ft [40] 193-350mi
- ▶ **New Flyer (150-600kWh)** up to 260mi
  - Xcelsior XE35 150 [32], 35 standees
  - Xcelsior XE40 150 [40], 42 standees
  - Xcelsior XE60 150 [50], 68 standees
- ▶ **BYD** up to 230mi
  - K7 30ft [22+1] 135mi
  - K9S 35ft [32+1] 230mi
  - K9 40ft [41+1] 255mi
  - K 60 ft [45] 230mi

## BEV School Buses [max passengers] Range

- ▶ **eLion** [72] 50-100mi
- ▶ **BlueBird All-American** [81] up to 120mi
- ▶ **Motiv Power Systems**
  - EPIC 4: Ford E-450 Chassis [20] up to 75mi
  - EPIC 6: Ford F-59 Chassis [48] up to 90mi

## School Districts Using BEV School Buses

- ▶ Sacramento - BEV School Buses
- ▶ White Plains - 5 BEV School Buses

## Cost Savings - Trucks & Buses

- ▶ Motiv Power Systems Garbage Truck
- ▶ Transpower Class-8 Electric Trucks
- ▶ Transpower PHEV School Bus
  - assuming \$0.11/kWh, \$4/gal, 6MPG

## Diesel Cost

\$0.80/mi  
 \$1.12-\$1.49/mi  
 \$0.66/mi

## Electric Cost

\$0.10/mi  
 \$0.23 - \$0.31/mi  
 \$0.22/mi

## Transit Vans, Shuttle Buses, Tractors, etc.

## Range

- ▶ **BYD: Class 5, 6, 8 & Terminal Tractor & Motor Coach (23ft- 45ft)** varies
- ▶ **Lightning Systems Transit Bus, Ford Transit Vans, & BEV, Class 3-8 Trucks PHEV** 50 - 100mi, varies
- ▶ **Motiv Power Systems: Class 4-6, Ford Chassis** E-450: 75mi, F-59: 90mi
- ▶ **Orange BEV: Terminal Trucks** 24hr+ runtime on single charge
- ▶ **Transpower: Transit, School, Yard Trucks, etc.** 60 - 100mi
- ▶ **UES Class 4-6** 40 - 125mi
- ▶ **Zenith Motors: Shuttle Van (159" WB) & Cargo Van (136" - 159" WB)** 80 - 135mi
- ▶ **Via Motors: GM Vans & Chevy Silverado PHEV** 40mi

## Pick-up Trucks

## E-Range, Total

<b>Retrofit</b> ALT-e: F-150 & other vehicles	25MPG	40mi, 490mi
<b>Retrofit</b> XL Hybrids: F-150 + F-250 Plug-ins & others as hybrids	50% increase in MPG	unknown
<b>PHEV</b> Workhorse: W-15 - 2019?	75MPGe, 28/32	80mi, 310mi
<b>BEV</b> Bison Pick-up - coming soon?	n/a	186mi

## Other Resources

- ▶ DOE's Alternative Fuel Data Center Tools & cost of an "eGallon"
- ▶ Atlas' Fleet Procurement Analysis Tool
- ▶ NYSERDA tool to see if a BEV or PHEV is right for you
- ▶ U.S. PIRG Report "Paying for Electric Buses"
- ▶ Fleetcarma - EV Adoption for Municipal Fleets
- ▶ Webinar - Fleet Procurement of Medium & Heavy Duty Electric Vehicles
- ▶ Inside EVs' Over 50 Plug-In EVs Compared: Price, Range + More