



Clean Fuel Profile: Electric Vehicles

Please note that this information is for reference only to provide general information and rough cost estimates for fleets interested in Hybrid Electric Vehicles (HEVs), Plug-In Hybrid Electric Vehicles (PHEVs), or All-Electric Vehicles (EVs). Fleets are encouraged to contact suppliers directly for exact costs related to their specific operations. Information on specific suppliers is included for reference only and is not an endorsement by the Regional Planning Commission or the Southeast Louisiana Clean Fuel Partnership for specific fuel/vehicle/conversion supplier. Fleets are encouraged to research suppliers before entering into a contract with them, performing the same due diligence they would for any other contract.

Cost of Electricity as a Transportation Fuel

Fuel	Estimated Cost per 100 miles*
Electricity – All-Electric Cars	\$4.04
Electricity – Hybrid Cars	\$4.04-\$6.88
Gasoline	\$9.04

Based on the US Dept. of Energy's January 2019 Alternative Fuel Price Report: (www.afdc.energy.gov/files/u/publication/alternative_fuel_price_report_jan_2019.pdf) and FuelEconomy.gov ([www.FuelEconomy.gov's Compare Side-by-Side Tool](http://www.FuelEconomy.gov's_Compare_Side-by-Side_Tool))

***Notes:**

- Estimated Cost per 100 miles is calculated by comparing a 2019 Nissan LEAF (All-Electric), 2019 Chevy Volt (Hybrid), and a 2019 Honda Civic (gasoline) using the [Compare Side-by-Side](#) tool on FuelEconomy.gov: www.fueleconomy.gov/feg/Find.do?action=sbs&id=41276&id=40924&id=40840
- Estimated fuel costs used in comparison: \$2.27 /gallon of gasoline based on [US Dept. of Energy's January 2019 Alternative Fuel Price Report](#); \$0.10 per kWh of electricity per the US Energy Information Administration
- Costs estimated based on 60% driving in stop & go/ city traffic and 40% highway driving
- The cost range for Hybrid vehicles reflects if the vehicle operates on all electric mode (lower value) or only on gasoline (higher value).
- US Dept. of Energy's (USDOE) [Vehicle Cost Calculator](#) allows fleets to compare the cost of owning and operating various vehicles over a vehicle lifetime: www.afdc.energy.gov/calc.

Available Financial Assistance & Incentives

Contact Courtney Young, Southeast Louisiana Clean Fuel Partnership Coordinator, for additional information on these opportunities: (504) 483-8519 / slcfp@norpc.org

- **Federal Qualified Plug-In Electric Vehicle Tax Credit**
 - An income tax credit for the purchase of a new qualified electric vehicle:
 - Minimum credit amount is \$2,500 per vehicle
 - An additional \$417 is allowed for the first 5 kWh of capacity plus \$417 for every kWh of capacity over 5 kWh, up to \$5,000
 - Maximum credit amount is \$7,500
 - For additional information including a database of vehicles, credit phase outs, and corresponding credit amounts, visit: www.irs.gov/Businesses/Qualified-Vehicles-Acquired-after-12-31-2009.



- **Louisiana Alternative Fuel Vehicles (AFVs) and Fueling Infrastructure Tax Credit**
 - Louisiana offers a nonrefundable income tax credit of:
 - 30% of the cost of converting a vehicle to operate on an alternative fuel
 - 30% of the cost of alternative fueling equipment
 - 10% of the cost of a new original equipment manufacturer AFV, up to \$2,500
 - Vehicles must be dedicated AFVs and registered in Louisiana
 - Commercial vehicles should be used in Louisiana and operate for at least four years.
 - Please note: All Louisiana tax credits are under review at the Louisiana State Legislature and applicants are encouraged to check with their tax professional or Louisiana Dept. of Revenue on the status of this credit and the amount eligible for a specific vehicle at the time the credit would be taken.
 - LA Dept. of Revenue Contact: Michelle Galland: michelle.galland@la.gov

- **Nissan LEAF Fleet Incentive Program**
 - \$3,000 discount for the purchase of a new Nissan LEAF for Governments, Commercial Businesses, and Universities.
 - Latest Summary Handout:
 - https://www.nissanusa.com/content/dam/Nissan/us/Nissan_Commercial_Vehicles/Nissan_Fleet/Program-and-Enrollment/pdfs/MY19_Nissan_Fleet_Sales_Program-Fleet_Accounts1.pdf
 - Contact: Courtney Young: (504) 483-8519 / slcfp@norpc.org

Types & Availability of Electric Vehicles

Information on types and availability of electric vehicles is located on the US Dept. of Energy's Alternative Fuel Data Center (AFDC): www.afdc.energy.gov/vehicles/electric_availability.html.

For up-to-date information on today's models, use the **Find a Car** tool on FuelEconomy.gov: www.fueleconomy.gov/feg/alternatives.shtml.

All-Electric Vehicles (EVs)

- EVs use a battery to store the electric energy that powers the motor and only use electricity to power the vehicle.
- Batteries are charged by plugging the vehicle into an electric power source and regenerative braking.

Plug-In Hybrid Electric Vehicles (PHEVs)

- Powered by an internal combustion engine that runs on conventional or alternative fuel and an electric motor that uses energy stored in a battery.
- Vehicle can be charged by an electric power source (i.e. plugged in to an outlet), by the internal combustion engine, or through regenerative braking.

Hybrid Electric Vehicles (HEVs)

- Powered by an internal combustion engine that runs on conventional or alternative fuel and an electric motor that uses energy stored in a battery.
- Battery is charged through regenerative braking and by the internal combustion engine and is not plugged in to charge.



Compare up to four vehicles at once to see fuel economy, range, annual fuel cost, and estimated 5-year savings using the [Compare Side-by-Side](#) feature:
www.fueleconomy.gov/feg/Find.do?action=sbsSelect.

For a comprehensive list of light-duty electric vehicles offered by major original equipment manufacturers (OEMs) in model year 2019, please visit the AFDC's **Model Year 2019 Alternative Fuel and Advanced Technology Vehicles** guide:
www.afdc.energy.gov/files/u/publication/model_year_2019_afv.pdf

Electric Vehicle Conversions

Conversion systems must be **certified by EPA** as compliant with emissions standards. Certifications are specific to vehicle make, model and year. EPA maintains a list of certified alternative fuel conversion systems on their website: www.epa.gov/vehicle-and-engine-certification/lists-epa-compliant-alternative-fuel-conversion-systems

Additional information on electric vehicles and conversions is located on the US Dept. of Energy's Alternative Fuel Data Center: www.afdc.energy.gov/vehicles/electric_conversions.html.

Hybrid / Plug-in Hybrid Electric Vehicle Conversions

Company: XL Fleet Electrification (www.xlfleet.com/)

Contact: Brian Piern: (617) 718-0329 / brian@xlhybrids.com

- XL sells and installs conversion kits for new and used Ford/GM vans and chassis.
- Time to set up appointment: Quote provided over the phone in minutes.
- Time to convert vehicle: 6 hours.
- Training: No special service training required.
- Technical Assistance after Conversion: As needed.
- Average Cost of Conversions: \$10,500 including system and installation.
- Warranty: 3 year / 75,000 mile parts and labor warranty.
- Conversion center location: New Vehicle ship-thru or local installation locations available.

Company: Odyne Systems (www.odyne.com)

Contact: Leonard Lincoln (262) 953-6705 / leonard.lincoln@odyne.com

- Odyne sells and installs plug-in hybrid systems for medium & heavy-duty vehicles.
- Time to set up appointment: They can provide a quote over the phone in 24 hours as long as all vital information is supplied.
- Time to convert vehicle: 2 to 3 weeks depending on the vehicle and storage options.
- Training: They offer service training for technicians who service the fleet and dealer/installer programs are available.
- Technical Assistance after Conversion: Any and all assistance needed is provided.
- Average Cost of Conversions: \$49,000 to \$69,500 including system and installation.
- Warranty: 3 year / 36,000 mile parts and labor warranty.
- Conversion center location: Pewaukee, WI



All-Electric Vehicle Conversions

A vehicle with an internal combustion engine can be converted to an EV by completely removing the engine and adding a battery pack, one or more electric motors, high-voltage cables, and instrumentation. To maximize EV driving range, such conversions are often performed on smaller, lighter-weight vehicles. Neither EPA nor CARB require that EV conversions be certified, as long as the conversion does not add a device that produces fuel combustion emissions.

Electric Vehicle Charging Stations

The US Dept. of Energy's Alternative Fuel Data Center includes information on **electric vehicle charging infrastructure**: www.afdc.energy.gov/fuels/electricity_infrastructure.html.

Pre-installation

Prior to installing an electric vehicle charging station, the Southeast Louisiana Clean Fuel Partnership recommends contacting your local utility provider to ensure that the lines in your area are adequate for your projected use:

- **Entergy**: Matt Dearmon, Commercial Development & Innovation: (504) 576-5231 / mdearmo@entergy.com
- **Entergy New Orleans**: Steve Molnar, Senior Economic Development Executive: (504) 670-3635 / imolnar@entergy.com
- **CLECO Power LLC**: (318) 484-7400 / www.cleco.com

Station Locations

The Alternative Fuel Data Center **Station Locator** notes the location of public and private electric vehicle charging stations: www.afdc.energy.gov/fuels/electricity_locations.html.

- **Plugshare** (www.plugshare.com) and **Chargepoint** (www.chargepoint.com) networks offer free mobile apps to help you find the nearest charging station, start your charging session, check your charging status and view your charging history. *Please note that some information on these apps is user-provided.*

Types of Charging Equipment

All commercially available PHEVs and EVs have the ability to charge via Level 1 and 2 charging equipment:

▪ **Level 1 Charging Equipment**

- Cost Range: Free with access to wall outlet; or \$300-\$1,500 for a Level 1 Charger
- 2 to 5 miles of range per hour of charging
- AC Level 1 is typically used for charging when there is only a 120V outlet available, but can easily provide all of a driver's needs. For example, 8 hours of charging at 120V can replenish about 40 miles of electric range.

▪ **Level 2 Charging Equipment**

- Cost Range: \$400 to \$6,000 per Level 2 Charger
- 10 to 20 miles of range per 1 hour of charging
- AC Level 2 equipment uses the same SAE J1772 connector and charge port that Level 1 equipment uses.



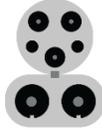
Side view (Left) and Charging Interface (Right) of a J1772 charge port used with Level 1 and Level 2 charging equipment





▪ **DC (Direct Current) Fast Charging Equipment**

- Cost Range: \$10,000 to \$40,000 per DC Fast Charger
- 50 to 70 miles of range per 20 minutes of charging
- There are three types of DC fast charging systems, depending on the type of charge port on the vehicle: a J1772 combo, CHAdeMO, or Tesla. Charger interfaces are shown below:



J1772 combo (used by Chevrolet and BMW)



CHAdeMO (used by Nissan, Mitsubishi, Toyota, and Fuji)



Tesla combo (used in Tesla Superchargers)

Fleet Charging

Fleets that choose to incorporate electric vehicles into their operations must account for several factors when planning for charging stations. Peak demand, duty cycles, drive cycles, routes, garaging locations, vehicle models, and availability of off-site public charging stations can all factor into decisions about the number, location, and type(s) of charging units. Clean Cities Coalitions, city planners, fleet managers, and utilities can work together with installers to determine the best locations.

For more information, see the Clean Cities Plug-In Electric Vehicle Handbook for Fleet Managers: www.afdc.energy.gov/pdfs/pev_handbook.pdf.

Electric Vehicle Charging Networks

The detailed information on specific charging networks below demonstrates the diversity among charging station networks, particularly those represented in the [AFDC Station Locator](#). As the charging network industry continues to expand, check back on the [AFDC Station Locator](#) for additional charging stations and information on other networks. Photos below are courtesy of the related manufacturer.

- **Webasto** (<https://www.evsolutions.com/ev-network>)

Contact: Charlie Botsford: (626) 357-9983 / botsford@avinc.com

Access: *Monthly subscription, pay-as-you-go.* Unlimited monthly access is provided for a monthly rate, or you may pay-as-you-go. To subscribe, contact the company or fill out a form online. You will receive a key fob in the mail, which is needed to initiate a charging session. A one-time activation fee of \$15 is required for new subscribers.

Cost: \$19.99 per month OR \$4.00-\$7.50 per charge



- **Blink (Car Charging Group)** (www.blinknetwork.com)

Contact: 888-998-2546, support@blinknetwork.com

Access: Pay-as-you-go. Start by registering a credit card with a Blink account. There are no required annual or monthly membership fees, and no minimum credit card balance. Once registered, you will receive an “InCard” and can initiate a charge using the card. Guests can also initiate a charge with Blink’s mobile application.

Cost: \$0.39-\$0.79 per kWh OR \$6.99-\$9.99 per charge



- **ChargePoint** (www.chargepoint.com)
 Contact: Dave Aasheim: (214) 449-7544 / dave.aasheim@chargepoint.com
Access: *Pay-as-you-go, free.* Sign up for free by submitting your credit card information via the website. You will receive an access card in the mail. If you initiate a session at a networked station that requires a fee, ChargePoint will assess an initial deposit of \$25. Stations can be activated by using the ChargePoint card or your registered credit card. Users who do not have a ChargePoint card can use the charger by calling the number provided on the charging station.
Cost: Cost per charge varies; \$25 deposit may be required.
- **GE WattStation Connect** (www.gewattstation.com/connect)
 Contact: 855-443-3873, wattstation.support@ge.com
Access: *Pay-as-you-go.* To start charging with WattStation Connect, register and log in through the website. You will then be asked to link your account to PayPal for payment, and download the WattStation Connect mobile application.
Cost: Cost per charge varies
- **SemaConnect** (www.semaconnect.com)
 Contact: 800-663-5633
Access: *Pay-as-you-go.* To sign up, log on to the SemaConnect website and open a new account with a \$20 balance charged to a major credit card. You will receive a “SemaCharge Pass” radio-frequency identification (RFID) card that can be used to initiate charging at any SemaConnect location. SemaConnect also offers mobile payments via its smartphone application, toll-free number, or via a QR code scan.
Cost: \$20 initial fee / Cost per charge varies
- **Tesla Supercharger** (www.teslamotors.com/supercharger)
 Contact: 877-79-TESLA
Access: *Free.* Tesla Superchargers do not require an access card; Tesla owners can drive up and plug in. The chargers are compatible with Tesla vehicles equipped with the 60-100 kilowatt-hour (kWh) battery pack that have been configured to use Superchargers. *Note that other PEV models cannot access Tesla Superchargers.*

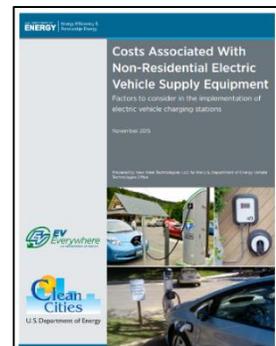


Multi-Network Access

Some companies have teamed up to facilitate access to multiple charging networks with one access/ payment card. For example, Nissan LEAF drivers can enroll in the **EZ-Charge program** (www.ez-charge.com) and charge on the Webasto, Blink and ChargePoint networks in certain markets.

Additional EV Charging Station Resources

Additional information and factors to consider on electric vehicle charging stations can be found in the Clean Cities handbook **Costs Associated with Non-Residential Electric Vehicle Supply Equipment:** www.afdc.energy.gov/uploads/publication/evse_cost_report_2015.pdf.





Fleets Currently using Electric Vehicles

Case Studies on fleets currently using electric vehicles can be found on the US Dept. of Energy's Alternative Fuel Data Center: www.afdc.energy.gov/case (select "**All-Electric, Hybrid Electric, or Plug-In Hybrid Electric**" under **Fuel/ Technology**). The Case Studies can also be searched by application (e.g., law enforcement). The Clean Fuel Partnership can connect you to the Clean Cities coordinators involved in these case studies to learn more from their experiences.

Local Fleets (2018 data):

- **Port of New Orleans**

- Vehicle Type: Car (Nissan Leaf)
- Number of Vehicles: 2
- Amount of Fuel Saved: 81 GGE
- Estimated cost savings: \$183.87



Port of New Orleans' Nissan LEAF charging

- **Solar Alternatives**

- Vehicle Type: Chevy Volt & Tesla
- Number of Vehicles: 2
- Amount of Fuel Saved: 1,781 GGE
- Estimated cost savings: \$4,043

- **Entergy**

- Vehicle Type: Chevy Malibu, Volt & Nissan LEAF
- Number of Vehicles: 7
- Amount of Fuel Saved: 379 GGE
- Estimated cost savings: \$860

- **Coca Cola Bottling Company United**

- Vehicle Type: Hybrid Delivery Truck
- Number of Vehicles: 10
- Amount of Fuel Saved: 3,074 GGE
- Estimated cost savings: \$6,978



- **Jefferson Parish**

- Vehicle Type: Pickup/SUV/Van (Hybrid Electric)
- Number of Vehicles: 5
- Amount of Fuel Saved: 354 GGE
- Estimated cost savings: \$804

- **Limousine Livery**

- Vehicle Type: Tesla Sedan
- Number of Vehicles: 1
- Amount of Fuel Saved: 607 GGE
- Estimated cost savings: \$1,378

- **RTA**

- Vehicle Type: Hybrid Buses
- Number of Vehicles: 16
- Amount of Fuel Saved: 24,198 GGE
- Estimated cost savings: \$54,930
- Vehicle Type: Electric Streetcars
- Number of Vehicles: 66
- Amount of Fuel Saved: 554,786 GGE
- Estimated cost savings: \$1,259,365



Information for Law Enforcement Fleets

Electric Vehicles utilized by Law Enforcement Fleets across the US include:

- Ford Police Responder Hybrid Sedan.: www.ford.com/police-vehicles/hybrid-police-responder
- Zero Motorcycles: www.zeromotorcycles.com
- T3 Motion: www.t3motion.com
- GEM Electric Car: www.polaris.com/en-us/gem-electric-car/applications/security-patrol
- Xtreme Green: www.xgpinc.com

Case Studies of Law Enforcement Fleets operating on Electric Vehicles:

- NYPD, LAPD Among Early Orders of Ford Police Responder Hybrid: www.government-fleet.com/321573/nypd-lapd-among-early-orders-of-ford-police-responder-hybrid
- Presque Isle Rangers Deploy Electric Motorcycle for Patrol: <https://www.goerie.com/news/20190427/presque-isle-rangers-deploy-electric-motorcycle-for-patrol>
- Seattle Uses All-Electric Nissan Leafs For Traffic Enforcement: www.greencarreports.com/news/1097866_electric-police-cars-seattle-uses-nissan-leafs-for-traffic-enforcement

Additional Resources

- Alternative Fuels Data Center - Electricity Section: www.afdc.energy.gov/fuels/electricity.html
- Electric Drive Transportation Association: <http://electricdrive.org>
- EV Everywhere Workplace Charging Challenge: www.energy.gov/eere/vehicles/workplace-charging
- Louisiana Electric Vehicle Group (EV-LA): <http://ev-la.org>
- National Drive Electric Week: <https://driveelectricweek.org>
- Plugin Louisiana: <http://pluginlouisiana.com>
- Plug In America: www.pluginamerica.org
- USDOE Hybrid and PEVs Handout: www.afdc.energy.gov/uploads/publication/hybrid_plugin_ev.pdf

USDOE EV Handbooks:

- Plug-In Electric Vehicle Handbook for Electrical Contractors: www.afdc.energy.gov/pdfs/51228.pdf
- Plug-In Electric Vehicle Handbook for Fleet Managers: www.afdc.energy.gov/pdfs/pev_handbook.pdf
- Plug-In Electric Vehicle Handbook for Public Charging Station Hosts: www.afdc.energy.gov/pdfs/51227.pdf