








Electric Vehicles on U. S. market

updated December 2016

(sorted by purchase price after tax credits; see other side for important info about leasing)

| Make / Model | Electric Range | Electric Power | MSRP (w/o dest.) | after Federal tax credit |
|--|----------------|----------------|--------------------------|-------------------------------------|
|  Ford Focus Electric | 115 miles | 143 HP | \$29.1k | \$21.6k |
| Ford's pure electric car, similar to a Nissan Leaf but nicer, loaded with features. A "conversion", battery blocking cargo space. 2017 model adds DCFC and more range and is sold nationwide. | | | | |
|  Nissan Leaf | 107 miles | 107 HP | \$30.7k-\$36.8k | \$23.2k (base) (+\$4k/\$6k) |
| Was most affordable EV until 2017, and is ubiquitous in Atlanta market. Base "S" model is stripped of key features; at least get DCFC option, or upgrade to SV / SL. 2 nd gen coming in 2018. | | | | |
|  Kia Soul EV | 93 miles | 109 HP | \$32.0k | \$24.5k |
| A "cute ute" with lots of interior room. Generous 10/100 drivetrain warranty. Uses same DCFC plug as Nissan Leaf. \$2000 "Plus" package includes heated front/rear seats & cooled front seats. | | | | |
| Tesla Model 3 | 200+ miles | ??? HP | \$35.0k | \$27.5k |
| SOLD OUT UNTIL AT LEAST EARLY 2019. Price shown is for base model, stripped of options. | | | | |
|  Chevrolet Bolt EV | 238 miles | 238 HP | \$36.2k | \$28.7k |
| NOT AVAILABLE IN GEORGIA UNTIL SOMETIME IN 2017. Chevy's game changer, far more range than any other EV in the market short of the Teslas. Optional DCFC enables roadtrips. | | | | |
|  BMW i3 BEV | 81-114 mi | 170 HP | \$42.4k | \$34.9k |
| RWD, very fast & fun car. DCFC. Two battery options. "BEV" version is pure electric; see below for "REX" version. Upcoming 2018 model year will update, so expect discounts on 2017 | | | | |
|  Tesla Model S | 210-315 miles | 382-800? HP | \$68k-\$135k w/o options | \$60.5k-\$127.5k w/o options |
| Large, extremely powerful luxury sedan. Multiple power / range options, available all-wheel drive. Proprietary "supercharging" DCFC at Tesla sites countrywide. Optns like Autopilot can add \$20k! | | | | |
|  Tesla Model X | 237-289 miles | 518-800? HP | \$89k-\$139k w/o options | \$81.3k-\$137k w/o options |
| Extremely powerful luxury SUV. All-wheel drive. Unique "falcon wing" doors open UP. Poor cargo capabilities (at 2016 launch). Ditto supercharging and options notes as with Model S above. | | | | |

| Make / Model | Electric Range | Electric Power | Gas range | MSRP (w/o dest.) | after Federal tax credit | Notes |
|---|----------------|----------------|------------|------------------|--------------------------|----------------------------|
| Range-Extended EVs: full performance electric drivetrain -- accelerate hard, go 90+ mph, with only electric power: | | | | | | |
| Chevrolet Volt | 53 miles | 150 HP | 400+ miles | \$33.2k | \$25.7k | original REx, now 2nd gen |
| BMW i3 REx | 97 miles | 170 HP | 83 miles | \$47.4k | \$39.9k | fastest REx car on market |
| Plug-in Hybrid EVs: weaker electric drivetrain, smaller battery and electric range, but still good performance: | | | | | | |
| Ford C-Max Energi | 20 miles | 91 HP | 400+ miles | \$27.1k | \$24.0k | battery in cargo area |
| Ford Fusion Energi | 20 miles | 118 HP | 400+ miles | \$33.1k | \$29.1k | battery in cargo area |
| Audi A3 etron | 17 miles | 101 HP | 400+ miles | \$38.9k | \$34.7k | base is loaded w/ features |
| BMW X5 40e | 13 miles | 111 HP | 400+ miles | \$55.7k | \$50.8k | all wheel drive |

Other models avail in GA but difficult to get and low volume:

BMW i8, Mitsu i-MiEV, Porsche models, Smart ED, VW e-Golf

Other models coming "soon" or available in California only:

BMW 330e, BMW 740e, Chrysler Pacifica Hybrid (plugin),

Fiat 500e, Hyundai/Kia models, Mercedes models,

Toyota Prius Prime, Volvo XC90

See www.OutsideEVs.com "monthly sales report" for full list.

Federal tax credit: up to \$7.5k ; will continue well into 2018.

Leasing is extremely popular with EVs, see other side for more.

Manuf. or dealer discounts may apply, get your own quote!

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Electric Vehicle Basics

Read this first if you are new to EVs like the Chevy Volt, Nissan Leaf, Tesla Model S/X/3, Ford Energi models, BMW i3 ...



What is an electric vehicle? An electric vehicle (EV) is propelled via an electric motor and an electric energy storage system like a battery, instead of an internal combustion engine and a gas tank.

Why now? Battery tech improvements have been driven by massive growth in portable consumer electronics (cell phones, cameras, laptops) – better performance with lower cost. Car makers have now engineered them to last 10-15 years.

Electric motors are fundamentally more efficient. Electric motors are FAR more efficient at converting energy into motion than internal combustion engines (ICE) -- 95% thermodynamic efficiency compared to 15-20% for an ICE.

Electric motors have full torque at zero RPM. They don't have a *minimum* operating RPM (idle RPM) like ICE engines do. So no clutches, no shifting, no parasitic transmission losses, and no "idling". EVs are stealth muscle cars!

Even with a dirty coal power plant, an EV is cleaner than an ICE. The most common misconception about EVs is that you are just transferring the point of emissions. But power plants are more efficient at converting fuel to power than a regular car's ICE could ever be – 33-50% compared to 15-20%. The transmission efficiency of the electric grid is also around 95%. Look into "well to wheels efficiency" analyses. Further, EVs are the only cars that get *cleaner* over time as the power grid gets cleaner with newer technologies.

EVs are far cheaper to maintain and fuel. The operating cost becomes virtually negligible. Plus you get to fuel your car at home, overnight, and it only takes a few seconds to plug / unplug.

EV sales are accelerating. As of December 2016 there are over 500,000 EVs on US roads, and they are selling at a rate of well over 10,000 per month.

Google for "top electric car myths".

Lease new, buy used. For EVs, leasing is smarter than buying, and 80% of EV sales are actually leases. You expose yourself to less technology risk, or being burdened later on with terrible resale value. Typical monthly payment is \$200-\$400, offset by fuel savings. Leases are also great for low-income buyers (w/ low tax liability) – you still benefit from the tax credits! Used EVs are incredible bargains; new EV tech pushes used EV value down, but they work fine and are reliable (just have less range).

Battery technology:

- Thermal Management System (TMS) matters!
- charging rate (DCFC) doesn't hurt, just do it
- typically warranted for 8 years / 100,000 miles

Public charging infrastructure: (like gas stations, but for EVs) Started taking off in 2011; 30,000+ stations nationwide, with dozens more every week. All use the same J1772 connector, shown above. Faster DC Fast Charging (DCFC) stations popping up, enabling ~20 minute charging. Note that public charging is largely irrelevant to plug-in hybrids like the Chevy Volt and Ford C-Max Energi. See website for separate fact sheet on Atlanta charging.

EV creates *choice* in how you power your car. With ICE you have no choice: it's oil or nothing. Electric power is cleaner, domestically produced, much cheaper than oil and will get cheaper and cleaner as more solar/wind capacity comes online.

Plug-in hybrids like the Chevy Volt are transitional vehicles between an oil-based transportation sector and an electricity-based sector. Being based on electricity gives us flexibility of energy sources. ICE cars can only be fueled by oil extracted from the ground; electricity can be generated from multiple energy sources.

We are witnessing the beginning of another technology revolution. Like the 1993-1995 Internet wave, EVs are disruptive technology. Think about the birth of digital photography in the late 90's -- who still uses film? CRT vs. LCD ...