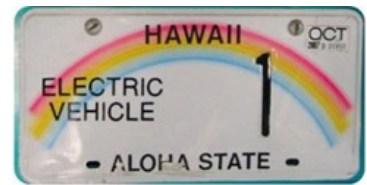


Electric Vehicles

An electric vehicle (EV) uses electricity in place of gasoline, reducing the need for petroleum-based fuel. Since EVs can use electricity produced from renewable resources available in Hawaii (i.e. sun, wind, hydropower, ocean energy, geothermal energy), the transition from gasoline fueled vehicles to EVs supports Hawaii's energy independence goals.



Based on statewide averages, the amount of fossil fuel used to power an electric vehicle in Hawaii is 34%-40% less than the fossil fuel required to power a similar gasoline-fueled vehicle.¹ This is expected to get even better as renewable energy increases in Hawaii.

Registered EVs and Public Charging Stations in Hawaii, March 2016²

County	Electric Vehicles	Level 2 ³ Charging Station Ports	Level 3 ⁴ Charging Station Ports	Total Ports
Oahu	3,233	260	15	275
Maui	693	82	35	117
Hawaii	195	56	2	58
Kauai	145	33	1	34
Total statewide	4,266	431	48	484

Fuel Cost Comparison

Vehicle	2015 Nissan Versa	2015 Honda Civic	2015 Nissan LEAF ⁵
Fuel Type	Gasoline	Gasoline	Electricity
Miles Per Gallon (MPG)	35 mpg combined 324 miles total range	33 mpg combined 462 miles total range	114 combined MPG 84 miles total range
Fuel Costs	\$2.50/gallon	\$2.50/gallon	Electricity: \$ 0.36/kWh
Cost to Drive 25 Miles	\$1.74	\$1.85	\$0.96
Fuel Cost per Year ⁶	\$627.03	\$666.67	\$345.95

Fuel cost comparisons show approximate savings between internal combustion engine and electric vehicles. The example above shows that fuel costs are lower for the Nissan LEAF than for a comparable gasoline fueled vehicle.

Hawaii EV Dealers and Showrooms by County

County	Nissan LEAF	GM/Chevy Volt	Mitsubishi iMiEV	Toyota plug-in Prius	Ford Focus, C-MAX, Fusion Energi	BMW i3 & i8	Cadillac ELR	Porsche Panamera S E-hybrid	Tesla Showroom	Kia Soul EV	Audi A3 E-Tron	Electric Smart Car
Oahu	3	3	1	3	4	1	1	1	1	3	1	1
Maui	1	1	0	1	1	0	0	0	0	1		
Hawaii	1	1	0	2	0	0	0	0	0	2		
Kauai	1	1	0	1	1	0	0	0	0	1		
State of Hawaii	6	6	1	7	6	1	1	1	1	7		

Electric Vehicles

Hawaii's electric vehicle laws and incentives include:

- Free parking is provided in state and county government lots, facilities, and at parking meters. (Act 168 of 2012, Hawaii Revised Statutes, 291-71, Note)
- Vehicles with EV license plates are exempt from High Occupancy Vehicle lane restrictions. (Act 168 of 2012, Hawaii Revised Statutes, 291-71, Note)
- Parking lots with at least 100 public parking spaces are required to have at least one parking space, equipped with an EV charging system, reserved exclusively for EVs. (Hawaii Revised Statutes 291-71)
- Non-EVs parked in a space designated and marked as reserved for EVs shall be fined not less than \$50 nor more than \$100. (Hawaii Revised Statutes 291-72)
- Hawaiian Electric Co. offer EV Time of Use Rates designed to incentivize customers, through lower rates, to charge their EVs during off-peak times of day.
- Multi-family residential dwellings or townhomes cannot prohibit the placement or use of EV charging systems altogether. (Hawaii Revised Statutes, 196-7.5)
- EV Charging Station, Multi-Unit Dwelling Working Group. (Act 164, 2015)

EV Quick Facts

The first car to arrive in Hawaii was Electric. ⁷	Year 1899
Amount of energy a fully charged Nissan LEAF has potential to tap	24 kWh
Best temperature range to operate lithium ion batteries (most common EV batteries today).	68°- 95° Fahrenheit
Hawaii ranks second in the nation behind California in the number of EVs registered in the state registered light cars and trucks in Hawaii are Electric. ⁸	4.2 out of every 1,000 registered light cars and trucks in Hawaii are EV
Cost for a government or commercial property owner to install a Level 2 charging station is	Approximately \$4,000-\$8,000 per station. A relatively simple project in Hawaii can range from \$4,000 to \$25,000 to \$100,000; however, prices vary considerably. ⁹



EV Stations Hawaii

The Hawaii State Energy Office developed a mobile app designed to help drivers locate publicly available EV charging stations statewide. *EV Stations Hawaii* helps drivers pinpoint charging stations as well as provide detailed information of the station giving them the confidence that they can recharge while on the road. The free app is available for Apple and Android smartphones and mobile devices.

<http://energy.hawaii.gov/testbeds-initiatives/ev-ready-program/ev-stations-hawaii-mobile-app>

EVs on the Move

EVs have a greater initial purchase price¹⁰ than comparable gasoline-fueled vehicles. Most experts, including Hawaii's auto dealers, believe that widespread acceptance of EVs will grow as a full battery charge provides greater driving range and the cost of EVs more closely matches the cost of conventional internal combustion engine (ICE) vehicles.

ENDNOTES

¹ State of Hawaii, Driving EVs Forward: A Case Study of the Market Introduction and Deployment of the EV in Hawaii, 2012.
http://energy.hawaii.gov/wp-content/uploads/2011/10/ReportMauiElectricVehicleAlliance_12_20_12.pdf

² <http://dbedt.hawaii.gov/economic/energy-trends-2/>

³ Level 2 charging is at 240 volts. All electric vehicles are equipped for this type of charging. A “charger” can have one or more ports. The number of “ports” determines how many vehicles each charger can service at a time. One “port” can service one vehicle.

⁴ Level 3, also known as “fast charging,” can provide an 80% charge for some vehicles in less than 30 minutes, depending on vehicle and charger specifications. Not all vehicles can use fast charging.

⁵ Fuel cost comparisons show approximate savings between internal combustion engine and electric vehicles. The example shows that fuel costs are lower for the Nissan Leaf than for a comparable gasoline fueled vehicle. Nissan Leaf: 24 kWh battery; 0.34 kWh per mile.

⁶ Based on fuel prices, 45% highway, 55% city driving, and 12, 078 annual miles per year from Hawaii State Data Book.
<http://dbedt.hawaii.gov/economic/databook/>

⁷ The Hawaiian Gazette., October 10, 1899, Page 4, Image 4 <http://chroniclingamerica.loc.gov/lccn/sn83025121/1899-10-10/ed-1/seq-4/>

⁸ EIA <https://www.yahoo.com/autos/s/california-washington-lead-other-states-electric-car-ownership-133329346.html>

⁹ Hawaii State Energy Office, Report to the Maui Electric Vehicle Alliance Driving EVs Forward: A Case Study of the Market Introduction and Deployment of the EV in Hawaii (PDF)

¹⁰ Ranging from mid-\$30,000 to \$40,000.