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 31% 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 Electric Vehicles (EVs) and Publically Available Charging Stations in Hawaii, September 2014

County	Electric Vehicles	Level 2 [2] Charging Station Ports	Level 3 [3] Charging Station Ports
Oahu	2147	257	4
Maui	534	74	7
Hawaii	147	46	1
Kauai	93	32	1
State of Hawaii	**2921**	**409**	**13**

Public charging, including fast charging, is needed as a convenience for EV drivers and to reduce range anxiety. The cost for a government or commercial property owner to install a Level 2 charging station is typically approximately $6,000-$8,000 per station. [4]

Hawaii's electric vehicle policies and incentives include:

- Free parking is provided in State and County Government lots, facilities, and at parking meters (Act 168 of 2012, formerly Act 290 of 1997).
- Vehicles with Electric Vehicle license plates are allowed access to High Occupancy Vehicle lanes (Act 168 of 2012).
- Parking lots with at least one hundred public parking spaces are required to have at least one parking space, equipped with an EV charging system, reserved exclusively for EVs (Act 089 of 2012, formerly Act 156 of 2009).
- Multi-family residential dwellings or townhouses cannot prohibit owners from installing EV chargers in their assigned parking spaces (Act 186 of 2010).
- Hawaiian Electric Companies offer EV Time of Use Rates designed to incentivize customers, through lower rates, to charge their EVs during off-peak times of day.

EVs have a greater initial purchase price[5] 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.

Hawaii EV Dealers by County

County	Nissan Leaf	GM/ Chevy Volt	Mitsubishi iMiEV	Toyota plug-in Prius	Ford Focus, C-MAX, Fusion	BMW i3
Oahu	3	3	1	3	3	1
Maui	1	1	0	1	1	1
Hawaii	0	1	0	2	0	
Kauai	1	1	0	1	1	
State of Hawaii	**5**	**6**	**1**	**7**	**5**	**2**

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

Fuel Cost Comparison

Vehicle	2014 Nissan Versa	2014 Honda Civic	2014 Nissan Leaf[6]
Fuel Type	Gasoline	Gasoline	Electricity
Miles Per Gallon (mpg)	30 mpg Combined 324 miles total range	35mpg Combined 462 miles total range	114 Combined mpge 84 miles total range
Fuel Costs	$ 4.25/gallon	$ 4.25/gallon	Electricity: $ 0.38/kWh
Cost to Drive 25 Miles	$ 3.54	$ 3.04	$ 2.85
Fuel Cost per Year[7]	$ 1,700	$ 1,450	$ 1,400

Electric Vehicle Land Speed Record	**303** miles per hour	Electric Vehicle Distance Record on a Single Charge	**423** miles[8]
Average distance driven by US driver in one day (easily accomplished by current EV technology).	**35** miles per day	Best temperature range to operate lithium ion batteries (most common EV batteries today).	**68°- 95°** Fahrenheit
EPA rating for 2013 Ford Fusion Energi plug in hybrid	**108** mpg city, **92** mpg hwy	Hawaii's rank in EV market share (1.6%)[9]	**1**

End Notes / References and Links

[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] 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.

[3] 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.

[4] Based on data collected by the State Energy Office, a relatively simple project in Hawaii can range from $4,000 to $25,000; however, prices vary considerably.

[5] Ranging from mid-$30,000 to $40,000.

[6] Nissan Leaf: 24 kWh battery; 0.34 kWh per mile.

[7] 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/

[8] The New York Times, "Father and Son Drive 423 miles on one charge," December 12, 2012.

[9] Source: Edmunds.com: http://www.edmunds.com/industry-center/analysis/drive-by-numbers-tesla-in-all-50-states.html?SID=uf3gp4u01sml&kw=flexibletexttool&PID=6154448&AID=10364102&mktid=cj260233&mktcat=affiliates