

Electric Vehicles Fact Sheet

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Electric Vehicles (EV) at a glance

Electric Vehicles operate on solely one or more electric motors powered by rechargeable battery packs. EV vehicles produce no tailpipe emissions and is completely independent of all other fuel sources.

Pro/Con list

Pros

- Energy efficient
- Environmentally friendly
- Performance benefits
- Reduction on foreign energy dependence
- Reduced noise pollution

Cons

- Driving range
- Battery charge time
- Battery cost
- Battery size and weight
- Limited existing infrastructure

Battery and Infrastructure

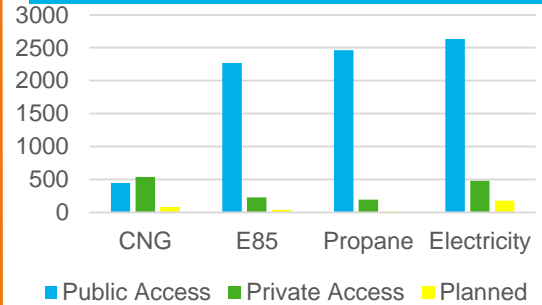
Battery

Large drawbacks associated with EV vehicles are due to certain constraints on the battery. Current lithium-ion powered batteries make them costly and heavy, increasing the capital cost and consumer inconvenience. Technology today is not capable of producing a battery that is cheap, light, and capable (in terms of range) enough to make it worth the switch to some consumers.

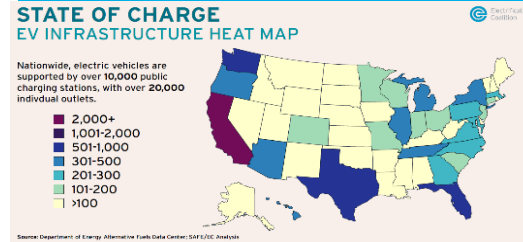
Infrastructure

The limited existing infrastructure for charging needs to become more widespread in order for electric vehicles to gain nationwide acceptance. While the existing infrastructure still has a way to go in terms of becoming a non-issue, it is clear that is one of the more robust alternative fuel networks in the nation.

Existing Alternative Fuel Stations in the U.S.



Existing Electric Charging Locations by State

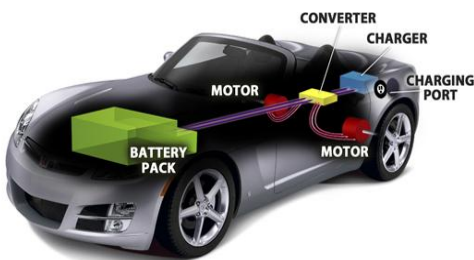


EV Vehicles – How Environmentally Friendly are They?

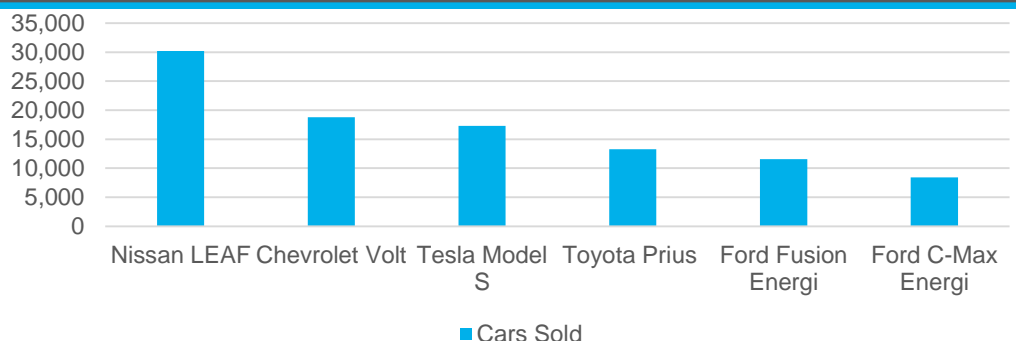
Although EV vehicles produce no carbon dioxide tailpipe emissions, one must take into account the possible emissions produced by the production of the electricity used. A 'well to wheels' (WTW) efficiency is a way of numerically quantifying how effectively the energy is getting from the source to your vehicle. As such, it is considered a complete energy vs emissions comparison.

Example Car	Technology	Fuel Source	CO ₂ content (g/MJ)	Well-to-Wheel	
				Efficiency (km/MJ)	Emissions (g/km CO ₂)
Honda CNG	Natural Gas Engine	Natural Gas	52.8	0.37	166.0
Honda Civic VX	Gasoline Engine	Crude Oil	73.0	0.52	141.7
Toyota Prius	Hybrid (Gas/Electric)	Crude Oil	73.0	0.56	130.4
Tesla Roadster	Electric	Natural Gas	52.8	1.15	46.1

EV Vehicle With Components Labeled



EV car sales by model for 2014



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Electric Vehicles (EV) at a glance

U.S. Department of Energy

For more information visit:
<https://www.fueleconomy.gov/feg/evtech.shtml>

Pro/Con list

U.S. Department of Energy

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<https://www.fueleconomy.gov/feg/evtech.shtml>
http://www.afdc.energy.gov/fuels/electricity_infrastructure.html

Battery and Infrastructure

"Two Electric Vehicle Myths: Debunked." Energy Policy Information Center. 22 Aug. 2014. Web. 21 Apr. 2015.
 <<http://energypolicyinfo.com/2014/08/two-electric-vehicle-myths-debunked/>>.

U.S. Department of Energy

For more information visit:
<http://www.afdc.energy.gov/fuels/electricityinfrastructure.html>
<https://www.fueleconomy.gov/feg/evtech.shtml>

Existing Alternative Fuel Stations in the U.S.

Chart developed using data from:
 "U.S. Energy Information Administration - EIA - Independent Statistics and Analysis." *Access to Alternative Transportation Fuel Stations Varies across the Lower 48 States*. 30 Apr. 2012. Web. 21 Apr. 2015.
 <<http://www.eia.gov/todayinenergy/detail.cfm?id=6050>>.
 Note: CNG is compressed natural gas, E85 is a type of gasoline-ethanol blend

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 <<http://energypolicyinfo.com/2014/08/two-electric-vehicle-myths-debunked/>>.

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Markowitz, Maury. "Wells to Wheels: Electric Car Efficiency." *Energy Matters*. 22 Feb. 2013. Web. 21 Apr. 2015.
 <<https://matter2energy.wordpress.com/2013/02/22/wells-to-wheels-electric-car-efficiency/>>.

For more information visit:
http://en.wikipedia.org/wiki/Life-cycle_assessment#Well-to-wheel

Eberhard, Martin, and Marc Tappening. "Tesla." *Tesla*. Web. 21 Apr. 2015.
 <<http://iqsoft.co.in/tesla.html>>.

EV Vehicle With Components Labeled

Internal Diagram of Electric Car (of AMP Saturn Sky) taken from:
<http://www.prweb.com/releases/2008/05/prweb968944.htm>

EV car sales by model for 2014

Data acquired from insideevs.com.
 For more information visit: <http://insideevs.com/monthly-plug-in-sales-scorecard/>