

The Electric Hedge

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New cars and new technology command hefty price premiums. To the chagrin of green-but-not-gold revolutionaries, the groundbreaking Leaf and Volt are necessarily new on both fronts for the time being. Nissan's all-electric (EV) Leaf topped the U.S. News & World Report's "upscale" small car list this year; it carries a \$32,780 starting price tag. GM's extended-range hybrid (PHEV) Chevy Volt was voted North American Car of the Year and is priced at \$40,000. Toyota's latest model of the hybrid Prius costs a bit more than half the latter amount, while comparable conventional vehicles can sell for less than half the price of their EV and PHEV counterparts. The Leaf and Volt may hold great appeal and long waiting lists, but in these economically challenging times, do they make any sense other than to make an ideological statement? Why pay the upfront premium?

Electric and extended-range hybrid vehicles will give you sticker shock, but they will also save you money down the road and protect you from the shock of higher oil prices. First, while their upfront cost is higher, electric vehicles have hugely *lower operating costs*. Assuming the current national average: you drive 12,000 miles per year, own your car for the average 6 years, and pay \$0.11/kWh for electricity and \$3.85/gallon for gasoline. The lifetime cost of a Leaf you buy today, including financing costs and federal subsidies, will be \$1,841 lower than the cost of a Nissan Altima. And the primary reason for the cost difference is the \$7,910 reduction in lifetime fuel costs. If you have range anxiety and/or need a vehicle that can drive for more than 100 miles at a stretch, then the Volt may be a better match. It will cost \$8,315 less to operate than the Chevy Impala, but will also take 9 years of ownership to compensate for the difference in upfront costs.

Leaf and Volt Cost Comparisons Under Current Conditions

Costs	Nissan Leaf	Nissan Altima	Chevy Volt	Chevy Impala
Upfront	\$ 32,780	\$ 20,950	\$ 40,000	\$ 23,790
Lifetime	\$ 31,815	\$ 33,656	\$ 40,490	\$ 37,716
Lifetime Fuel	\$ 1,716	\$9,626	\$ 2,110	\$ 10,428

Figures calculated using the Rocky Mountain Institute's Project Get Ready calculator

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The chart above does not include *lower maintenance costs*. The Electric Power Research Institute estimates that EVs incur half the costs of their conventional counterparts: EVs do not need oil and filter changes, spark plug replacements, and timing chain adjustments; brakes last twice as long due to the regenerative braking mechanism.

Granted, Leaf and Volt purchasers would not come close to breaking even under current cost conditions but for the \$7,500 federal tax break. Fleet operators, by contrast, can break even more quickly due to economies of scale, longer ownership, higher and highly predictable utilization rates, and lower (commercial and industrial) electricity rates. If a sizeable fraction of the over 16 million fleet vehicles moved towards electrification, the market would be large enough for battery and other component costs to significantly fall and boost EV and PHEV price competitiveness for individual consumers.

In the meantime, another factor could quickly tip the scale in favor of electric vehicles: higher oil prices. If you believe that within the next decade oil prices are likely to gradually or sharply, then purchasing an EV or PHEV is your personal *hedge against oil prices*. If oil prices in the US rose to European levels of \$8/gallon, the lifetime fuel costs of the Altima and Impala would almost equal the cost of the vehicle itself. The Leaf's lifetime cost would shrink to \$12,217 less than the Altima's cost, and the Volt, to \$7,926 less than the Impala. No subsidies needed.

Leaf and Volt Cost Comparisons Under High Oil Prices

Costs	Nissan Leaf	Nissan Altima	Chevy Volt	Chevy Impala
Lifetime	\$ 31,815	\$ 44,032	\$ 41,030	\$ 48,956
Lifetime Fuel	\$ 1,716	\$20,000	\$ 2,649	\$ 21,669

Furthermore, electric vehicles empower you to *hedge against energy insecurity* in general. Oil dependence puts you at the mercy of global supply disruptions you cannot foresee or control, whereas electricity can be domesticated. If you are not satisfied with the grid's reliability, the price or electricity, or your utility's carbon footprint, you can always produce your own by installing a geothermal system or solar panels in your home. And in the event of an electric supply shock, you can also use your car's battery as a back-up generator.

Given that the Leaf and Volt have earned high plaudits, the federal and many state governments are offering alternative fuel vehicle tax credits, auto manufacturers are extending highly favorable financing terms, and oil prices are rising, it makes sense to consider an EV or PHEV if you are in the market for a new car. It's not too early to start thinking about an electric hedge.