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## Who Will Buy Tomorrow's Electric Vehicles?

“Almost every existing OEM, along with new U.S. market entrants, have electric vehicles in their product plans.”

The race to build fuel-efficient vehicles is heating up, fueled by a convergence of factors. Gas prices, while still relatively stable around \$70 per barrel<sup>1</sup>, are sure to climb significantly once a recovery takes shape in the U.S. The Obama Administration is also using both the “carrot and the stick” to push its environmental agenda: it recently announced a \$2.4 billion grant to develop advanced electric and hybrid batteries<sup>2</sup>, and has started loaning money to major OEMs as part of its \$25 billion program to support the development of fuel-efficient vehicles<sup>3</sup>. The Administration previously enacted new CAFE rules requiring passenger vehicles to reach an average of 35.5 mpg by 2016<sup>4</sup>.

Automotive manufacturers have taken notice of the government’s actions. Going beyond hybrid vehicles, almost every existing OEM has electric vehicles in their product plans. New auto makers such as CODA and Tesla have also emerged in the electric vehicle market. Among the electric models already announced for the upcoming years are:

- **2010:** Chevrolet Volt, CODA electric passenger car, Dodge sports car, Nissan Leaf, Smart For Two
- **2011:** Cadillac Converj, Mitsubishi i MIEV, Tesla Model S

Who will buy these electric vehicles? Are there lessons we can learn from today’s marketplace to help OEMs and dealers predict the future buyer profile? How will external market forces shape buying decisions? This Polk View answers these and other questions.

### The Tesla Experience

One of the only electric vehicles on the road today is the Tesla Roadster, which was launched in 2008. Through July 2009, Tesla has sold over 500 Roadsters, each retailing at over \$100,000. Since plug-in vehicles will command a large premium over their gasoline-powered counterparts, other OEMs can learn from Tesla’s experience in determining the profiles of likely consumers.

One-quarter of Tesla buyers own or owned other sports cars. Surprisingly, about half of Tesla’s sales came from owners of non-luxury makes. And while the quantities were small, just as many Prius as Porsche 911 buyers purchased the Tesla Roadster! Toyota, Mercedes-Benz, and Lexus are the brands Tesla buyers tend to own, with 39 percent of Tesla buyers also owning these vehicles. Based on this experience, buyers of other OEMs’ electric vehicles will likely have a diverse mix of vehicles in their garage.

Over 80 percent of Tesla buyers have an income over \$100,000, compared with less than 50 percent for Prius owners. A similar trend will likely be observed among early adopters of electric vehicles, which will have a high price tag compared to similarly-sized gas vehicles.

### Lessons from the Past: Hybrids

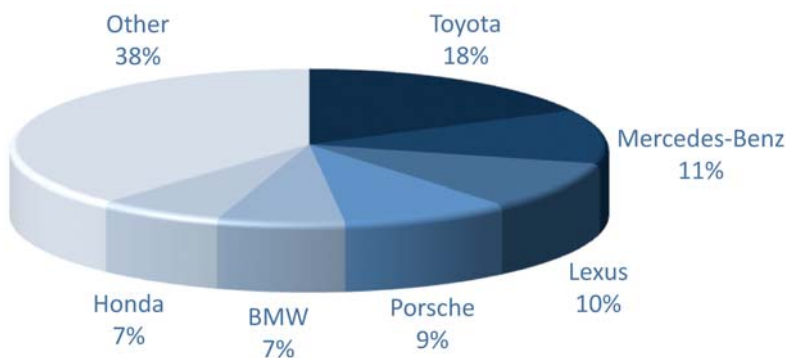
The Tesla Roadster is virtually the only electric vehicle currently on the road. Hybrid vehicles, therefore, are the closest point of comparison for determining likely buyer profiles and factors affecting purchase. We looked at the relationship between gas prices and hybrid vehicle market share; where hybrid vehicle buyers are located; other types of vehicles currently owned and buyer demographics – all factors that may affect electric vehicle sales.

#### #1: Gas prices will be a major factor in electric vehicle sales

Gas prices impact hybrid vehicle sales significantly. **Figure 2** (on next page) shows that most major shifts in gas prices have been accompanied by similar shifts in hybrid market share. For example, hybrid sales peaked during the summer of 2008, when gas prices were also at their highest. Hybrid sales were at a relative low point in December 2008, when gas prices were at a four-year low. As gas prices climbed back up in 2009, sales of hybrid vehicles followed.

*continued*

Figure 1: Other Vehicles Owned by Tesla Owners



<sup>1</sup> U.S. Energy Information Association - <http://www.eia.doe.gov/>

<sup>2</sup> “U.S. Automakers Get Piece of \$2.4 Billion in U.S. Battery Grants,” *Automotive News*, August 5, 2009

<sup>3</sup> “House Bill Passes with \$25 Billion More for Fuel-Saving Technology,” *Automotive News*, June 29, 2009

<sup>4</sup> CAFE rules: white house website [http://www.whitehouse.gov/the\\_press\\_office/President-Obama-Announces-National-Fuel-Efficiency-Policy/](http://www.whitehouse.gov/the_press_office/President-Obama-Announces-National-Fuel-Efficiency-Policy/)

Demographic and registration data in this Polk View is from personal retail registrations from January through May 2009.



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Based on this trend, consumers will likely be more willing to pay the premiums for electric vehicles when gas prices are high. Gas prices might be expected to rise as global demand for oil, especially in developing nations, continues to increase.

**#2: Consumers in California will account for a substantial share of U.S. electric vehicle sales**  
 Alternatively-fueled vehicles do well in California (Figure 3). Through May 2009, California accounted for 20 percent of nationwide sales of hybrids, double the rate of gasoline vehicles sold in the state. For electric vehicles (primarily Tesla), that figure reached nearly 50 percent. The high rate of hybrid sales is all the more impressive because it has actually trended down from a high of 29 percent in the spring of 2008. Since then, California has been severely impacted by the current recession, and its unemployment rate (11.9 percent in July 2009) is now one of the highest in the nation<sup>5</sup>.

As the economy improves, sales of hybrid and electric vehicles in California should also rebound.

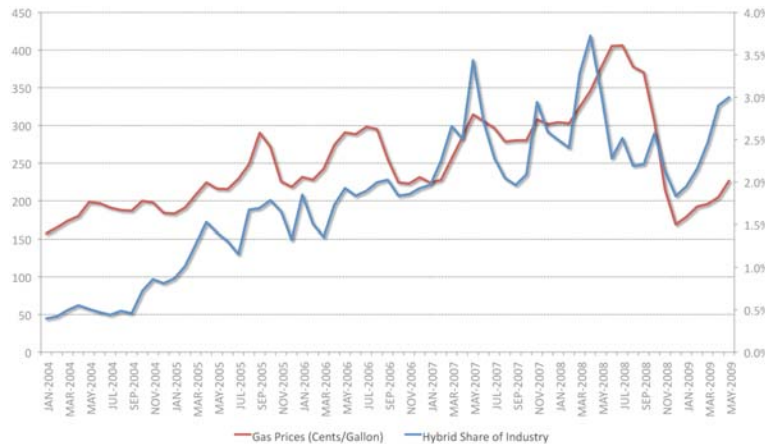
### #3: Electric vehicle buyers will likely already own a similar class of vehicle

Consumers tend to buy hybrid vehicles in the same class as a vehicle they already own, and the trend is expected to hold true for electric vehicles. For example, Polk loyalty data from 2008 indicates that 30 percent of Prius and 31 percent of Camry hybrid owners came from midsize cars. Twenty percent of Escape hybrid owners came from the compact SUV segment.

### #4: Electric vehicle buyers will tend to be more affluent and less ethnically diverse

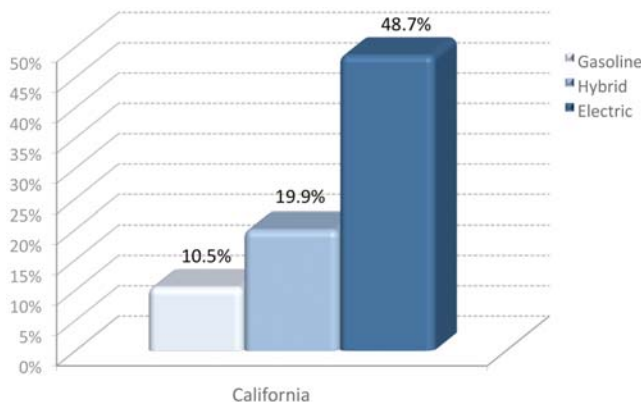
Almost 48 percent of hybrid owners had a household income above \$100,000, compared to 35.2 percent for gas-powered vehicle owners. Hybrid vehicles usually carry a premium, which partially explains the difference. Only 14.1 percent of hybrid owners were of African-American, Asian, or Hispanic origin; this compares to 20.4 percent for gas-powered vehicle owners.

Figure 2: Relationship between Gas Prices and Hybrid Vehicle Market Share



Sources: U.S. Energy Information Administration, Polk

Figure 3: California's Share of U.S. Vehicle Sales



<sup>5</sup> U.S. Bureau of Labor Statistics – [www.bls.gov](http://www.bls.gov)

## Electric Vehicle Launch Strategy

OEMs about to launch electric vehicles should consider the following:

- Educate the buyer about the benefits of electric vehicles:** OEMs and dealers should communicate key consumer benefits, both environmental and financial (such as tax credits and lower fuel expenditures). Automakers should also be prepared to address buyer objections, such as low speed/range, challenges of battery replacement and the ability to charge batteries away from home.
- Target receptive audiences:** While California will be a key selling area for electrics, other states (e.g., Washington, New York, Illinois, Virginia) should also be targeted due to residents' propensity to purchase hybrid vehicles. Current hybrid owners may be ready to move to other "green" vehicles. Polk's experience from developing predictive targeting models shows existing hybrid owners are 10 times more likely to buy another hybrid than the general population. OEMs should also consider marketing to buyers who already drive a car or truck in a vehicle segment that will be available in an electric version. As Polk has seen with hybrid owners, we'd expect that a segment of these owners would be interested in a more energy-efficient electric vehicle.
- Appeal to key purchase motivators:** Electric vehicles will likely command premiums, and therefore attract more affluent buyers. Buyers may be motivated by several factors, including image/prestige, unique styling, financial (tax breaks) or practical (High Occupancy Vehicle lanes) incentives and environmental appeal.