

Environmental Consumerism and the Role of the Hybrid Auto in Hawaii

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[**Abstract**] The purpose of the research is to explore the relationship between consumer behavior and the impact of the hybrid on the auto industry and the environment. The research is a case study based on a literature review of relevant Hawaiian, national, and international publications and a survey of Hawaiian consumers. The results of the research revealed that regardless of age and gender, respondents agreed that they would purchase a hybrid car if the cost was the same as a traditional gas-fueled car and to support environmentally friendly legislation.

[**Keywords**] Auto industry; Hawaii; hybrid; consumer; environment

Introduction

Motivating consumers to purchase hybrid automobiles is a major concern of the automobile industry, the government, and environmental managers. In the context of consumer behavior, automobile emissions are the single largest contributor to several pollutants (almost fifty percent of personal pollution), including carbon dioxide and nitrous oxide, both designated as greenhouse gas (GHG) emissions under the Kyoto Protocol (UN, 1997, 2005). The purpose of this research, which includes a survey of Hawaiian consumers, is to explore the relationship between consumer behavior and the impact of the hybrid on the auto industry and the environment. The purpose of the survey is to determine the predisposition of Hawaiian residents to purchase a hybrid auto and agree to support legislation which provides tax credits to protect environmental quality.

Hybrid Autos and Environmental Quality

Hybrids are known to use a fraction of the gas of non-hybrid autos due to their ability to share the burden, with their electric motors. Full-hybrid vehicles allow their electric motor to work independently of the more traditional internal combustion engine while driving at low speeds. This, in turn, saves gas and stops harmful emissions from entering the atmosphere (Hick, 2009). The auto industry is actively pursuing routes that will reduce dependence on fossil fuels. General Motors plans on investing \$2.9 billion in developing alternative fuels and technology and increase fuel economy from 12% to 120%. The Ford Motor company is developing plug-in hybrids, electric power, and Eco-Boost engines (green engines). Chrysler also is actively developing fuel-efficient vehicles, such as the ENVI (electric) starting in 2010 (Hybrid Car.com, 2009).

General Motors (GM) is now trying to change its image to a “green” company. GM was considering changing the background of its logo to green to show it is environmentally conscious. GM subsequently decided against this change and, instead, publicize GM as an organization that cares about the environment and is committed to producing products that meet the needs of the consumer in efficient cars that use less fossil fuel and is environmentally sound (Krisher & Thomas, 2009).

Hybrid autos, which are based on the combination of a gasoline and an electric engine, require some adaptation by consumers. However, recent studies predict that over fifty hybrid models will be available in the next ten years, with sales of hybrid car making up eighty percent of the total market. In addition to the hybrid technology, numerous other improvements are available to reduce emissions in both hybrids and gas-powered vehicles. Many foresee the coming of fuel cell technology, which is expected to run vehicles with twenty percent or less of today’s emission levels. Table 1 compares the emissions, rank, and cost of fuel of eight hybrid vehicles as of 2005 (Hybrid Car.com, 2005).

Table 1. A Comparison of Hybrid Vehicles (2005)

Make	Model	Class	City L/100Km	Hwy L/100Km	Carbon Dioxide (Kilogram)	Rank	Cost of Fuel (US \$)
Honda Insight	Hybrid	2-seater	3,9	3,3	1,900	1 / 986	720
Toyota Echo	Gas	Sub-compact	6,7	5,2	2,800+	11 / 986	1,190
Toyota Prius	Hybrid	Sedan	4	4,2	1,950	2 / 986	820
Pontiac Sunfire	Gas	Sedan	9,2	6,1	3,600+	62 / 986	1,530
Ford Escape	Hybrid	SUV	6,6	7	3,100+	20 / 986	1,360
Jeep Grand Cherokee	Gas	SUV	17	11,4	6,700+	854 / 986	2,840
Toyota Tacoma	Gas	Truck	11,4	8,1	4,700+	335 / 986	1,950
Dodge Ram 1500	Gas	Truck	26,7	19	9,500+	986 / 986	4,570

Comparing Hybrid Sales in Hawaii and the U.S. Mainland

The overall sale of hybrids in the United States is quite low and only 1% of the 17 million autos sold in the United States in 2004 were hybrid, (Durbin, 2005). Analytical Solutions for R.L Polk and Company, which collects and analyzes car data, maintain that federal and state credits have given the consumer an incentive to purchase hybrid cars (Hybrid Car sales, 2009). According to Servco Automotive Vice President Wes Kimura, sales of Toyota hybrids Prius, Camry and Highlander increased in 2008 to the point where they now account for 10% of all Toyota sales. Kimura stated that “while most of this increased demand was driven by the spike in fuel prices in mid-2008, the percentage of hybrids sold remained relatively stable even as the price of fuel has dropped in recent months. We believe that both consumers and businesses are aware of the volatility in the price of fuel and are preparing for the eventual rise in prices” (Tsai, 2009).

In an interview with Mr. Frank Kudo, the President and CEO of New City Nissan in Hawaii, Mr. Kudo expressed the view that “hybrids are still too expensive to develop and manufacture and will be replaced by the electric vehicle which is more efficient and will have a lower unit production cost than the hybrid” (Kudo, 2009). In Honolulu, the city and county is significantly expanding its growing fleet of hybrid buses. Officials purchased 10 extra-long articulated hybrid buses in 2008. This is in addition to the 10 articulated hybrid buses purchased in 2004 and the 40 standard 40-foot buses acquired in 2006. There is other ample evidence of the government’s increased interest in alternative-energy transportation.

The state Department of Transportation purchased eight new “clean diesel” buses in 2008. Clean diesel, also called ultra-low sulfur diesel, is more refined and “cleaner” than traditional diesel and has proven more fuel-efficient in commercial use. In 2009, Mayor Mufi Hannemann purchased 100 new hybrid buses and 50 paratransit vehicles at a cost of \$85 million. Also in January 2009 the Honolulu Police Department began a six-month trial of hybrid vehicles. The department is evaluating six Toyota Camry hybrids for performance and cost savings. HPD spokesperson Michelle Yu said officers who drive the vehicles provide weekly reports on their performance. Of particular consideration according to Yu, “is whether the cars are able to reliably power mobile data computers and other electronic hardware used by officers, but it looks good at this point” (Tsai, 2009).

Survey of Hawaii Consumers

A survey of Hawaiian residents 18 and over was conducted in March and April 2009. Three hundred and fifty questionnaires were distributed island-wide to non-random sample of owners of non-hybrid cars. The respondents were asked to indicate their degree of agreement with the eight questions asked. Of the 298 responses to the questionnaire, 39% were male and 61% female, 31% were 18-26 years old, 21% 27-35, 20% 36-45, 23% 46-65 and 5% were 66 and older.

This survey was more of an exploratory study utilizing a non-probability sampling method. Respondents were selected based on the known characteristic of auto ownership other than a hybrid. The purpose of the survey was to determine the predisposition, measured in terms of level of agreement, of Hawaiian residents to purchase hybrid automobiles and other related environmentally friendly products, as well as support for legislation which provides tax credits to improve and protect environmental quality. It is hoped that the results of this exploratory study will help generate a hypothesis to be more fully tested by future research in this area.

In evaluating the questionnaires returned by the respondents, there appears to be no significant difference in the respondents' level of agreement with the questions as they pertain to gender. All age groups were in agreement about supporting legislation giving tax credits for purchasing environmentally friendly cars. All age groups also agreed with legislation for tax credits to companies that produce products that are safe for the environment and tax credits to consumers who purchase products that are environmentally safe for the community, such as hybrid automobiles. It should also be noted that all respondents, regardless of age or gender, agreed that they would purchase an environmentally friendly automobile if the cost were the same as a traditional gas-fueled car.

Upon further analysis, the results revealed a relatively significant correlation of the respondents' agreement to purchase a hybrid automobile if it costs the same as the gas-fueled automobile, and their agreement to support legislation that gives tax credits to companies that produce products that are safe for the environment, and increased penalties for government agencies, private organizations and individuals that pollute the environment.

Conclusion and Recommendations

Apparently, Hawaiian consumers will purchase environmentally friendly products if it does not affect their pocket book and will back legislation that gives tax credits to the consumer and the organization producing the product. Most of the respondents to the survey seem to be concerned with the environment and support government legislation with penalties for government agencies, private organizations, and individuals who pollute the environment. Maria Repole, Toshiba's corporate communications director, asserted that "consumers are thinking more and more about their impact on the planet, and as a result they are looking for brands and products that are committed to the environment" (Repole, 2009).

What have the auto makers done to bring environmentally sound cars to the market? Toyota is the leader with their Prius. Honda has its Insight hybrid and GM, Ford, and Chrysler are now bringing products to market that are environmentally friendly with a minimal use of gas. The key issue for the major automobile manufacturers is the cost, which needs to be comparable to conventional automobiles to make an impact on the consumer and the environment. In order for the majority of consumers to purchase "green" vehicles, the manufacturers will have to market these vehicles with a more competitive price.

The results of the research, while exploratory, suggests that Hawaiian consumers are aware of the need to improve environmental quality. The support of government intervention through environmentally friendly legislation should provide tax credits for hybrid autos and other related products and increase penalties for polluters. Hopefully, the results of this exploratory study will help generate a hypothesis which will be tested further in future research related to consumer behavior and environmental quality.

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