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WHAT DO CURRENT OWNERS OF HYBRIDS AND NON-HYBRIDS THINK ABOUT HYBRIDS?

MICHAEL SIVAK
BRANDON SCHOETTLE

UMTRI
UNIVERSITY OF MICHIGAN
TRANSPORTATION RESEARCH INSTITUTE

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Michael Sivak
Brandon Schoettle

The University of Michigan
Transportation Research Institute
Ann Arbor, Michigan 48109-2150
U.S.A.

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16. Abstract

This survey examined the views of U.S. motorists concerning hybrid vehicles, both in terms of their current vehicles and future vehicles. The survey yielded completed responses from 1,002 owners of a hybrid and 1,038 owners of a non-hybrid.

The main findings related to **current owners of a hybrid** are as follows:

- The main reason given for owning a hybrid is the environmental impact; females are more concerned than males about this aspect of hybrid ownership.
- Only a small percentage of respondents report any hybrid-specific problems.
- About 4/5 intend to buy a hybrid again for their next vehicle; about 1/3 of them intend to buy a plug-in hybrid.
- Out of those that do not intend to buy a hybrid for their next vehicle, about 1/6 are planning to get an electric vehicle.

The main findings related to **current owners of a non-hybrid** are as follows:

- The most frequent reasons given for not getting a hybrid as the current vehicle are not considering hybrids at all and the initial cost.
- About 1/3 of respondents intend to buy a hybrid for their next vehicle.

In looking ahead to the future, this report also contains a table that summarizes 14 aspects of 12 different fuel sources (including hydrogen) that will likely influence driver acceptance.

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Introduction

Hybrid vehicles utilize more than one form of energy for propulsion. The most common type, hybrid-electric vehicles, involves a combination of an internal-combustion engine and one or more electric motors. In 2013, 544,537 hybrid vehicles were sold in the U.S. (including 49,008 plug-in hybrids), representing 3.8% of all light-duty vehicles sold that year (AFDC, 2014d; 2014f; 2014g).

This report focuses on consumer acceptance issues related to hybrids. Of special interest are the factors that led current owners of hybrids to purchase them, and factors that influence future acceptance of hybrids. The approach involved a survey of opinions of current vehicle owners about hybrids and non-hybrids in the U.S.

Background

Market penetration

The U.S. annual sales of hybrids from 1999 through 2013 and their market share are listed in Table 1.

Table 1
Annual sales in the U.S. of all hybrids
(AFDC, 2014d; 2014f; 2014g).

Year	Number of hybrids sold			Percent of all vehicles sold
	Non-plug-in	Plug-in	*Total*	
1999	17		*17*	<0.1%
2000	9,350		*9,350*	0.1%
2001	20,282		*20,282*	0.1%
2002	36,035		*36,035*	0.2%
2003	47,600		*47,600*	0.3%
2004	84,199		*84,199*	0.5%
2005	209,711		*209,711*	1.3%
2006	252,636		*252,636*	1.7%
2007	352,274		*352,274*	2.3%
2008	312,386		*312,386*	2.2%
2009	290,271		*290,271*	3.1%
2010	274,210	326	*274,536*	2.5%
2011	268,807	7,671	*276,478*	2.3%
2012	434,344	38,584	*472,928*	3.5%
2013	495,529	49,008	*544,537*	3.8%

Although the first mass-produced hybrid that was sold in the U.S. was the Honda Insight (in 1999), the key role in the introduction of hybrids in the U.S was played by the Toyota Prius. For example, in 2001 (the second year of its sales in the U.S.), the Prius represented about three quarters of all hybrids sold. The annual sales of the Prius from 2000 through 2013 and its market share are listed in Table 2.

Table 2
Annual sales in the U.S. of Toyota Prius hybrids
(AFDC, 2014d; 2014f; 2014g).

Year	Number of hybrids sold			Percent of all hybrids sold
	Non-plug-in	Plug-in	*Total*	
2000	5,562		*5,562*	59.5%
2001	15,556		*15,556*	76.7%
2002	20,119		*20,119*	55.8%
2003	24,600		*24,600*	51.7%
2004	53,991		*53,991*	64.1%
2005	107,897		*107,897*	51.5%
2006	106,971		*106,971*	42.3%
2007	181,221		*181,221*	51.4%
2008	158,574		*158,574*	50.8%
2009	139,682		*139,682*	48.1%
2010	140,928		*140,928*	51.3%
2011	136,463		*136,463*	49.4%
2012	223,906	12,749	*236,655*	50.0%
2013	222,140	15,384	*237,524*	43.6%

Technological highlights

The concept of hybrid vehicles is not a new one. Already in 1900, Porsche produced Semper Vivus, "the world's first functional, full-hybrid car. In this vehicle, two generators paired with petrol engines formed a single charging unit, simultaneously supplying electricity to wheel-hub motors and batteries" (Porsche, 2011). The first application for a U.S. patent related to hybrid vehicles was filed in 1905 by Henri Pieper

(for the "mixed drive for autovehicles"), and the patent was granted in 1909 (Berman, 2009).

However, the introduction of modern hybrid vehicles at the beginning of this century would not have been possible without the technological advances made in the 1970s by TRW on electromechanical transmission (Berman, Gelb, Richardson, and Wang, 1971) and by David Arthurs on regenerative braking (Itankar, 2011).

For a more detailed discussion of the history of hybrids, please consult Fuhs (2008).

U.S. governmental actions

The Corporate Average Fuel Economy (CAFE) regulations (NHTSA, 2014), first introduced in 1975 in response to the oil embargo, was the most important governmental mandate for the relatively successful introduction of modern hybrid vehicles in the U.S. The CAFE regulations require the fleet of each vehicle manufacturer to meet a minimum vehicle fuel economy (Schoettle and Sivak, 2014).

Another governmental initiative of importance was the Partnership for a New Generation of Vehicles (PNGV). This cooperative research program between the government and vehicle manufacturers focused on developing more fuel-efficient vehicles. The program ran from 1993 to 2001.

Relevant tax incentives for purchasing hybrids in the U.S. are listed in Table 3.

Table 3
Tax incentives (IRS, 2014a, 2014b).

Hybrid type	Max credit	Start date	End date
Non-plug-in	$3,400	2005	2010 or first 60,000 sold for each manufacturer (whichever is first)
Plug-in	$7,500	2010	2014 or first 200,000 sold for each manufacturer (whichever is first)

Market forces

An important aspect in the introduction of hybrids was an increase in the price of gasoline during the first decade of this century. Table 4 shows the average annual price of regular gasoline from 1998 through 2013.

Table 4
Average annual price of regular gasoline (EIA, 2014).

Year	Dollars per gallon
1998	1.03
1999	1.14
2000	1.48
2001	1.42
2002	1.35
2003	1.56
2004	1.85
2005	2.27
2006	2.57
2007	2.80
2008	3.25
2009	2.35
2010	2.78
2011	3.52
2012	3.62
2013	3.51

Method

Survey instrument

An online survey was conducted using SurveyMonkey (www.surveymonkey.com), a web-based survey company. A questionnaire was developed to examine several topics related to ownership of hybrid vehicles. Basic demographic information about the respondents was also collected. The text of the questionnaire is included in the appendix. The survey was performed in June 2014.

Respondents

SurveyMonkey's Audience tool was used to recruit individuals 18 years and older who belonged to one of two groups: current owners of a hybrid and current owners of a non-hybrid. The recruitment resulted in completed responses from 1,002 current owners of a hybrid and 1,038 current owners of a non-hybrid.

Demographic Aspects of the Respondents

Tables 5 through 11 describe the respondents in the two samples in terms of gender, age, education, employment, income, geographical location, and distance to the nearest city with at least 100,000 people. The main differences were as follows:

Females represented a larger proportion of the respondents in the hybrid-owner group than in the non-hybrid-owner group (Table 5). Consequently, in the results section to follow, the combined data are based on equal weighting of female and male responses.

The respondents in the hybrid-owner group tended to:

- be older (Table 6),
- be more educated (Table 7),
- be less likely to be employed full time (Table 8),
- have greater income (Table 9),
- be more likely to reside in the Pacific census region (Table 10), and
- be more likely to live near a city with at least 100,000 people (Table 11).

Table 5
Gender of the respondents in the two samples (%).

Gender	Owners of hybrids	Owners of non-hybrids
Female	78	58
Male	22	42

Table 6
Age of the respondents in the two samples (%).

Age	Owners of hybrids	Owners of non-hybrids
18-29	6	19
30-39	5	15
40-49	9	19
50-59	27	22
60-69	37	19
≥70	16	7

Table 7
Education of the respondents in the two samples (%).

Education	Owners of hybrids	Owners of non-hybrids
Less than high school	<1	<1
High school	3	7
Some college	12	19
Associate degree	4	10
Bachelor degree	29	35
Graduate degree	51	29

Table 8
Employment of the respondents in the two samples (%).

Employment	Owners of hybrids	Owners of non-hybrids
Employed full-time	48	61
Employed part-time	10	9
Not currently employed	5	6
Retired	35	18
Full-time student	2	6
Part-time student	1	1

Table 9
Income of the respondents in the two samples (%).

Household annual income ($)	Owners of hybrids	Owners of non-hybrids
0-49,999	15	29
50,000-99,999	36	38
100,000-149,999	25	21
150,000-199,999	10	7
≥200,000	14	5

Table 10
Location of the residence of the respondents in the two samples (%).

Location (census region)	Owners of hybrids	Owners of non-hybrids
New England	7	8
Middle Atlantic	9	11
East North Central	12	17
West North Central	7	8
South Atlantic	18	17
East South Central	3	3
West South Central	6	8
Mountain	8	9
Pacific	30	19

Table 11
Distance from nearest city with at least 100,000 people
of the respondents in the two samples (%).

Distance to a city with at least 100,000 people	Owners of hybrids	Owners of non-hybrids
0-50 miles	84	80
51-100 miles	11	14
>100 miles	5	6

Results: Current Owners of a Hybrid

Current hybrid types

Table 12 shows the distributions of the two basic types of hybrids for owners of a hybrid. Only 6% of the combined sample owned a plug-in hybrid.

Table 12
Current hybrid, by type (%).

Hybrid type	Females	Males	Combined
Not a plug-in	95	92	94
Plug-in	5	8	6

Main reason for getting a hybrid for the current vehicle

The most frequent reason given for getting a hybrid as the current vehicle (see Table 13) was to reduce the environmental impact (33% of the combined sample), followed by being less expensive in the long run (28%), and to use less energy (25%). Females tended to be more concerned than males about the environmental impact (38% vs. 29%) and less concerned about the expense in the long run (26% vs. 30%).

Table 13
Main reason for getting a hybrid for the current vehicle (%).

Main reason	Females	Males	Combined
To reduce the environmental impact	38	29	33
Less expensive in the long run	26	30	28
To use less energy	25	25	25
Other reasons	11	16	14

Problems with the current hybrid

A vast majority of the respondents (93%) reported no hybrid-specific problems with their current hybrids (Table 14). Battery problems were listed by only 3% of the respondents.

Table 14
Hybrid-specific problems with the current hybrids (%).

Problem	Females	Males	Combined
None	91	94	93
Battery replacement/problem	4	3	3
Less power/speed than non-hybrids	1	0	<1
High repair costs/must get repairs at dealership	1	<1	1
Charging problem or malfunction	1	1	1
Problem finding charging stations	<1	0	<1
Problem getting or giving jump starts	1	0	<1
Other problems	3	1	2

Next vehicle

Most current owners of hybrids (83%) intend to get a hybrid again as their next vehicle (Table 15). If those who plan not to get another vehicle (6%) are excluded, then 88% of current vehicle owners intend to get a hybrid again.

Table 15
Next vehicle, by type (%).

Vehicle type	Females	Males	Combined
Not a hybrid	8	13	11
Hybrid	85	81	83
No vehicle	7	6	6

Type of the next vehicle if a hybrid

Out of the current owners of hybrids who intend to also get a hybrid as their next vehicle, 22% expect it to be a plug-in (Table 16). If those who are unsure about the type are excluded, then this percentage increases to 33%, as compared to 6% of the current hybrids (Table 12).

Table 16
Next hybrid, by type (%).

Type	Females	Males	Combined
Not a plug-in	47	43	45
Plug-in	19	25	22
Unsure	34	31	33

Main reason for getting a hybrid for the next vehicle

The most frequent response given for the main reason for getting a hybrid for the next vehicle (see Table 17) is to reduce the environmental impact (41%), followed by using less energy (26%) and being less expensive in the long run (25%). (These percentages are similar to those for the main reason for getting a hybrid as the current vehicle [see Table 13], except that the environmental impact tended to be even more important for the next vehicle than the current vehicle.) Females tended to be more concerned than males about the environmental impact.

Table 17
Main reason for getting a hybrid for the next vehicle (%).

Main reason	Females	Males	Combined
To reduce the environmental impact	44	38	41
To use less energy	27	25	26
Less expensive in the long run	24	26	25
Other reasons	5	11	8

Fuel source of the next vehicle if not a hybrid

For those respondents that do not plan to get a hybrid for their next vehicle (Table 18), 17% are planning to get an electric vehicle (21% if those who are unsure are excluded).

Table 18
Fuel source of the next vehicle if not a hybrid (%).

Fuel source	Females	Males	Combined
Gasoline	64	54	59
Diesel	3	7	5
Electric	13	21	17
Other	2	0	1
Unsure	19	18	18

Main reason for not getting a hybrid for the next vehicle

The most frequent reasons given for not getting a hybrid for the next vehicle (Table 19) were that hybrids are too expensive initially (16%), not available in the desired vehicle type (13%), and not considered hybrids at all (11%).

Table 19
Main reason for not getting a hybrid for the next vehicle (%).

Main reason	Females	Males	Combined
More expensive initially	17	14	16
Not available in vehicle type I want/need	19	7	13
Have not considered hybrids at all	11	11	11
Hybrids do not save much energy	11	7	9
Concerns about the reliability	6	11	8
Other reasons	36	50	43

Barriers to getting a hybrid for the next vehicle

For those respondents that are not planning to get a hybrid for their next vehicle (Table 20), 47% indicated that there is nothing that would cause them to reconsider this decision; 16% indicated that availability of initially less expensive hybrids would cause them to reconsider. Males were more likely than females to indicate that there is nothing that would cause them to reconsider this decision (54% vs. 41%); females were more likely than males to indicate that availability of hybrids that are less expensive initially would cause them to reconsider (22% vs. 11%).

Table 20
Barriers to getting a hybrid for the next vehicle (%).

Is there anything that would cause you to consider a hybrid for your next vehicle?	Females	Males	Combined
No	41	54	47
Less expensive initially	22	11	16
Better handling/performance	5	7	6
Better mileage	6	0	3
Longer battery life	2	0	1
Other	25	29	27

Results: Current Owners of a Non-Hybrid

Fuel source for the current non-hybrids

For the current owners of a non-hybrid, only 2% of vehicles were not powered by gasoline (Table 21).

Table 21
Fuel source for the current non-hybrids (%).

Fuel source	Females	Males	Combined
Gasoline	99	98	98
Diesel	1	2	1
Electric	<1	0	<1

Main reason for not getting a hybrid for the current vehicle

About a third of the current owners of a non-hybrid have not considered a hybrid as an option for the current vehicle (see Table 22). The second most frequent reason given was the initial cost (28%), with this factor being more important for females than males (32% vs. 23%). Concern about the reliability of hybrids was the main reason for only 5% of the respondents.

Table 22
Main reason for not getting a hybrid for the current vehicle (%).

Main reason	Females	Males	Combined
Have not considered hybrids at all	31	35	33
More expensive initially	32	23	28
More expensive in the long run	8	10	9
Concerns about the reliability	4	6	5
Other reasons	25	26	25

Next vehicle

About one third of current owners of a non-hybrid are planning to get a hybrid for their next vehicle (Table 23). Females are more likely to do so than males (37% vs. 26%).

Table 23
Next vehicle, by type (%).

Vehicle type	Females	Males	Combined
Not a hybrid	56	66	61
Hybrid	37	26	31
No vehicle	7	8	8

Type of next vehicle if a hybrid

As is evident in Table 24, out of the current owners of a non-hybrid who intend to get a hybrid as their next vehicle, 17% expect it to be a plug-in (35% if those who are unsure are excluded). Males show a stronger tendency for plug-ins than females (21% vs. 13%; 39% vs. 31% if those who are unsure are excluded).

Table 24
Next hybrid, by type (%).

Type	Females	Males	Combined
Not a plug-in	29	33	31
Plug-in	13	21	17
Unsure	58	46	52

Main reason for getting a hybrid for the next vehicle

The most frequent response given for the main reason for getting a hybrid for the next vehicle (see Table 25) was to reduce the environmental impact (46%), followed by being less expensive in the long run (24%), and to use less energy (23%). Females tended to be more concerned than males about the environmental impact (53% vs. 38%), and less concerned about the expense in the long run (21% vs. 27%) and about using less energy (20% vs. 27%).

Table 25
Main reason for getting a hybrid for the next vehicle (%).

Main reason	Females	Males	Combined
To reduce the environmental impact	53	38	46
Less expensive in the long run	21	27	24
To use less energy	20	27	23
Other reasons	6	8	7

Fuel source for the next vehicle if not a hybrid

For the current owners of a non-hybrid who also intended to get a non-hybrid for their next vehicle, 7% indicated that their next vehicle would be powered by a fuel source other than gasoline (Table 26). If those who are unsure are excluded, this percentage increases to 8%.

Table 26
Fuel source of the next vehicle if not a hybrid (%).

Fuel source	Females	Males	Combined
Gasoline	79	78	78
Diesel	3	6	5
Electric	1	2	1
Other	1	1	1
Unsure	16	13	15

Main reason for not getting a hybrid for the next vehicle

The most frequent reasons respondents gave for not getting a hybrid for the next vehicle (Table 27) were that they had not considered hybrids at all (31%), more expensive initially (20%), and more expensive in the long run (16%).

Table 27
Main reason for not getting a hybrid for the next vehicle (%).

Main reason	Females	Males	Combined
Have not considered hybrids at all	32	31	31
More expensive initially	24	17	20
More expensive in the long run	14	18	16
Concerns about the reliability	6	6	6
Other reasons	24	28	27

Barriers to getting a hybrid for the next vehicle

For those respondents who are not planning to get a hybrid for their next vehicle (Table 28), 46% indicated that there is nothing that would cause them to reconsider this decision; 26% indicated that availability of hybrids that are initially less expensive would cause them to reconsider. Females were more likely than males to indicate that availability of hybrids that are less expensive initially would cause them to reconsider (29% vs. 22%).

Table 28
Barriers to getting a hybrid for the next vehicle (%).

Is there anything that would cause you to consider a hybrid for your next vehicle?	Females	Males	Combined
No	47	45	46
Less expensive initially	29	22	26
Offer hybrid trucks or more powerful SUVs	1	4	2
Better handling/performance	2	2	2
More charging stations	2	1	1
Larger vehicles or more cargo area	<1	1	<1
If used hybrids would be available	1	1	1
Other	17	25	21

Going Beyond Hybrids

This report focused on driver-acceptance issues with hybrid vehicles. In looking ahead to the future, Table 29 summarizes several aspects of other alternative (and current) fuel sources that will likely influence driver acceptance and preference.

Table 29
Relevant aspects of alternative fuel sources.

Aspect	Gasoline	Diesel (No. 2)	Ethanol (E85)	Biodiesel (B20)	Methanol
Refueling infrastructure	Yes	Yes	Yes	Limited	Limited
Number of public refueling stations[1, 2, 3, 4]	114,223	57,100	2,408	288	147
Fuel price[5]	$3.65/gal	$3.97/gal	$3.41/gal	$4.01/gal	$1.45/gal
Gasoline-gallon equivalent (GGE) percent[6]	100%/gal	113%/gal	73%/gal	109%/gal	49%/gal
Average fuel economy (mpg)[7]	22.2	29.6	13.5	29.0‡	n/a
Effective cost per mile	$0.16	$0.13	$0.25	$0.14	n/a
Driving range (average)†	444 mi	592 mi	270 mi	580 mi	n/a
Time to refuel[8]	~5 min	~5 min	~5 min	~5 min	~5 min
High voltage	No	No	No	No	No
High pressure	No	No	No	No	No
Availability of qualified mechanics	Yes	Yes	Yes	Yes	Yes
Availability of qualified emergency responders	Yes	Yes	Yes	Yes	Yes
Number of vehicle models available[7]	290	35	90	11	0††
Vehicle maintenance issues	-	-	Similar to gasoline	Similar to diesel	Similar to gasoline

[1] U.S. Census Bureau (2012)
[2] AFDC (2014a)
[3] Assumes approximately 50% of gasoline stations sell diesel (no. 2) (NACS, 2014a).
[4] Murphy's Machines (2014)
[5] AFDC (2014b)
[6] AFDC (2014c)
[7] EPA (2014b) [for model year 2014]
[8] NACS (2014b)
‡ Based on a 2% reduction in fuel economy versus diesel (no. 2) (EPA, 2014a).
† For liquid-fueled vehicles, range calculations assume a 20-gallon fuel tank.
†† Current methanol usage is primarily for race vehicles.

(continued)

Table 29 (continued)
Relevant aspects of alternative fuel sources.

Aspect	Non-plug-in hybrid (HEV)	Plug-in hybrid (PHEV)	Battery electric (BEV)
Refueling infrastructure	Yes	Yes (for gasoline); charging network exists; new receptacles are needed	Charging network exists; new receptacles are needed
Number of public refueling stations[1, 2, ‡]	114,223 (gasoline stations)	114,223 (gasoline stations) 8,481 (electric stations) 20,525 (charging outlets)	8,481 (electric stations) 20,525 (charging outlets)
Fuel price[3]	$3.65/gal	$3.65/gal ; $0.12/kWh	$0.12/kWh
Gasoline-gallon equivalent (GGE) percent[4]	Varies by drivetrain type and hybridization level	Varies by drivetrain type and operating mode	100% @ 33.7 kWh
Average fuel economy (mpg)[5]	32.5	37.1	102.1
Effective cost per mile	$0.11	Variable	$0.04
Driving range (average)[5, †]	650 mi	440 mi	106 mi
Time to refuel[5, 6]	~5 min	0.75 to 5 hours	3.5 to 7 hours
High voltage	Yes	Yes	Yes
High pressure	No	No	No
Availability of qualified mechanics	Limited	Limited	Limited
Availability of qualified emergency responders	Yes	Yes	Yes
Number of vehicle models available[5]	36	10	13
Vehicle maintenance issues	Similar to gasoline; battery replacement issues	Similar to gasoline; battery replacement issues	Lower maintenance than gasoline; battery replacement issues

[1] U.S. Census Bureau (2012)
[2] AFDC (2014a)
[3] AFDC (2014b)
[4] AFDC (2014c)
[5] EPA (2014b) [for model year 2014]
[6] NACS (2014b)
[‡] For PHEV and BEV recharging, "electric stations" are the physical locations that contain one or more "charging outlets" (i.e., individual plugs).
[†] For liquid-fueled vehicles, range calculations assume a 20-gallon fuel tank.

(continued)

Table 29 (continued)
Relevant aspects of alternative fuel sources.

Aspect	Propane (LPG)	Compressed natural gas (CNG)	Liquefied natural gas (LNG)	Hydrogen
Refueling infrastructure	Yes	Limited	Limited	Limited
Number of public refueling stations[1]	2,714	745	59	12
Fuel price[2, 3]	$3.31/gal	$2.15/GGE	$2.31/GGE	$4.00/GGE
Gasoline-gallon equivalent (GGE) percent[4]	73%/gal	100%/ 127 cu. ft.	64%/gal	100%/kg
Average fuel economy (mpg)[5]	n/a	31.0	n/a	60.0
Effective cost per mile	n/a	$0.07	n/a	$0.07
Driving range (average)[5]	n/a	192 mi	n/a	231 mi
Time to refuel[6, 7, 8]	~5 min	~5 min (fast-fill)	Variable	~5 min
High voltage	No	No	No	Possibly
High pressure	Yes	Yes	Yes	Yes
Availability of qualified mechanics	Limited	Limited	Limited	Limited
Availability of qualified emergency responders	Limited	Limited	Limited	Limited
Number of vehicle models available[5]	0	1	0	3
Vehicle maintenance issues	High-pressure tanks require maintenance	High-pressure tanks require maintenance	High-pressure tanks require maintenance; protective equipment required when refueling	Lower maintenance than gasoline; high-pressure tanks require maintenance

[1] AFDC (2014a)
[2] AFDC (2014b)
[3] CAFCP (2014)
[4] AFDC (2014c)
[5] EPA (2014b) [for model year 2014]
[6] FerrellAutogas (2014)
[7] AFDC (2014e)
[8] DriveClean (2014)

Key Findings

Current owners of a hybrid

- Environmental impact was the most important reason for buying a hybrid as the current vehicle (33%); this concern is even more important for those who intend to buy a hybrid as their next vehicle as well (41%).

- Environmental impact is more important for females than for males (38% vs. 29% for the current hybrid; 44% vs. 38% for the next hybrid).

- Most current owners of a hybrid (83%) intend to buy a hybrid as their next vehicle as well.

- Plug-in hybrids represent a small percentage of current hybrids (6% in our sample); this percentage is expected to increase greatly for those intending to buy a hybrid as their next vehicle as well (22%; 33% if those who are unsure about the type of hybrid are excluded).

- Only a small percentage (7%) of current owners of a hybrid report any hybrid-specific problems; out of those reporting any such problems, the largest problems are battery related.

- Out of those current owners of a hybrid that do not intend to buy a hybrid as their next vehicle, 17% are planning to get an electric vehicle (21% if those who are unsure are excluded).

- The most frequent reason given for not getting a hybrid for the next vehicle is the initial cost, but even that percentage is only modest (16%).

- For those current owners of a hybrid that are not planning to get a hybrid for their next vehicle, 47% indicated that there is nothing that would cause them to reconsider this decision; 16% indicated that availability of hybrids that are initially less expensive would cause them to reconsider.

Current owners of a non-hybrid

- The most frequent reasons given for not getting a hybrid as the current vehicle are not considering hybrids at all (33%) and the initial cost (28%); the most frequent reason given for not getting a hybrid for the next vehicle are, again, not considering hybrids at all (31%) and the initial cost (20%).

- Diesel is the fuel source for 1% of the current non-hybrids, as compared to 5% for the next non-hybrids.

- 31% of current non-hybrid owners intend to buy a hybrid for their next vehicle.

- 17% of those intending to get a hybrid as their next vehicle are planning to get a plug-in (35% if those who are unsure are excluded).

- For those current owners of a hybrid that are not planning to get a hybrid for their next vehicle, 46% indicated that there is nothing that would cause them to reconsider this decision; 26% indicated that availability of hybrids that are initially less expensive would cause them to reconsider.

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Appendix: Questionnaire

Introduction (all respondents)

We are interested in the different factors that influence which type of vehicle people decide to purchase or lease.

In this survey, when we use the term "vehicle," we mean any type of passenger vehicle, including cars, sport utility vehicles (SUVs), vans, minivans, and pickup trucks.

"Vehicle" does NOT include motorcycles, scooters, bicycles, or any other 2-wheeled or 3-wheeled vehicles.

Please select one option that best describes your CURRENT vehicle:

(a) My current vehicle IS a hybrid.
(b) My current vehicle IS NOT a hybrid –OR–
I currently do not own or lease a passenger vehicle

For CURRENT Non-hybrid drivers –OR– those with no passenger vehicle

Select one option that best describes your CURRENT vehicle:

(a) Gasoline powered
(b) Diesel
(c) Electric
(d) I currently do not own or lease a passenger vehicle
(e) Other (please specify): _____

If current vehicle = Hybrid…

Select one option that best describes your CURRENT vehicle:

(a) Plug-in hybrid
(b) Other hybrid

What was the MAIN reason for buying/leasing a hybrid for your CURRENT vehicle?
Select one option only

(a) I wanted to use less energy
(b) I wanted to reduce my environmental impact
(c) I wanted to be perceived as caring about the environment
(d) The hybrid I purchased was less expensive to buy/lease than the non-hybrids I considered
(e) I believed that the savings in the cost of gasoline while owning my current hybrid will exceed the increased initial cost of buying/leasing it
(f) I was able to drive alone in high-occupancy vehicle (HOV) lanes
(g) For a tax incentive
(h) For free or reduced-cost parking available for hybrids
(i) For a reduced cost of vehicle registration
(j) Company vehicle (someone else at the company made the decision)
(k) Other reason (please specify): _____

Have you experienced any problems specific to owning/leasing a hybrid that would not likely be experienced by non-hybrid vehicle drivers?

(a) No
(b) Yes (please specify): _____

If current vehicle = Non-hybrid…

What was the MAIN reason for NOT buying/leasing a hybrid for your CURRENT vehicle?
Select one option only

(a) I did not consider buying/leasing a hybrid at all
(b) I did not believe that hybrids save much energy
(c) I did not believe that hybrids have much of an environmental impact
(d) Driving a hybrid was not perceived as caring about the environment as much as it used to be
(e) The hybrids I considered were more expensive to buy/lease than the non-hybrid I purchased
(f) I believed that the savings in the cost of gasoline used while owning a hybrid would not exceed the increased initial cost of buying/leasing it
(g) The hybrid I considered would not allow me to drive alone in high-occupancy lanes
(h) I was concerned about the reliability of hybrids
(i) A tax incentive is no longer available
(j) Free or reduced-cost parking for hybrids was no longer available
(k) Reduced cost of vehicle registration was no longer available
(l) Company vehicle (someone else at the company made the decision)
(m) Lack of public charging stations (for plug-in hybrids)
(n) Other reason (please specify): _____

Plans for next vehicle (all respondents)

Please select one option that best describes your plans for your NEXT vehicle:

(a) My next vehicle IS likely to be a hybrid.
(b) My next vehicle IS NOT likely to be a hybrid.
(c) I do not plan to own or lease a passenger vehicle in the future.

If future vehicle = Hybrid…

Select one option that best describes your plans for your NEXT vehicle:

(a) Plug-in hybrid
(b) Other hybrid
(c) Unsure

What is the MAIN reason for planning to buy/lease a hybrid as your NEXT vehicle?
Select one option only

(a) I want to use less energy
(b) I want to reduce my environmental impact
(c) I want to be perceived as caring about the environment
(d) The hybrid I plan to purchase is less expensive to buy/lease than the non-hybrids I considered
(e) I believe that the savings in the cost of gasoline while owning my future hybrid will exceed the increased initial cost of buying/leasing it
(f) I will be able to drive alone in high-occupancy vehicle (HOV) lanes
(g) For a tax incentive
(h) For free or reduced-cost parking available for hybrids
(i) For a reduced cost of vehicle registration
(j) Company vehicle (someone else at the company made the decision)
(k) Other reason (please specify): _____

If future vehicle = Non-hybrid…

Select one option that best describes your plans for your NEXT vehicle.

(a) Gasoline powered
(b) Diesel
(c) Electric
(d) Unsure
(e) Other (please specify): _____

What is the MAIN reason for NOT planning to buy/lease a hybrid as your NEXT vehicle?
Select one option only

(a) I have not considered buying/leasing a hybrid at all for my next vehicle
(b) I do not believe that hybrids save much energy
(c) I do not believe that hybrids have less of an environmental impact
(d) Driving a hybrid is currently not perceived as caring about the environment as much as it used to be
(e) The hybrid I considered is more expensive to buy/lease than the non-hybrid I plan to purchase
(f) I believe that the savings in the cost of gasoline while owning a hybrid would not exceed the increased initial cost of buying/leasing it
(g) The hybrid I considered would not allow me to drive alone in high-occupancy vehicle (HOV) lanes
(h) I am concerned about the reliability of hybrids
(i) A tax incentive is no longer available
(j) Free or reduced-cost parking for hybrids is no longer available
(k) Reduced cost of vehicle registration is no longer available
(l) Company vehicle (someone else at the company made the decision)
(m) Lack of public charging stations (for plug-in hybrids)
(n) Other reason (please specify): _____

Is there anything that would cause you to consider a hybrid for your next vehicle?

(a) No
(b) Yes (please specify): _____

If future vehicle = No vehicle…

What is the MAIN reason you do not plan to own or lease a passenger vehicle in the future?
Select one option only

a) I do not have a valid driver's license
b) I plan to own a 2-wheeled or 3-wheeled motorized vehicle (motorcycle, scooter, etc.)
c) Owning and maintaining a vehicle is too expensive
d) I will be able to get rides from others
e) I prefer to bike or walk
f) I prefer to use public transportation
g) I have a disability, medical, or vision problem
h) I am able to communicate and/or conduct business online instead
i) I am concerned about how driving impacts the environment
j) I do not like to drive/afraid to drive
k) Other (please specify): _____

Will you have access to a passenger vehicle owned by someone else that you will be able to drive if needed?

a) Yes
b) No

Demographics (all respondents)

What is your gender?
(a) Female
(b) Male

What is your age? [18-99 years old]

What is the highest level of education you have completed?
(a) Less than high school degree
(b) High school graduate
(c) Some college
(d) Associate degree
(e) Bachelor degree
(f) Graduate degree

What is your current level of employment?
(a) Full-time employment
(b) Part-time employment
(c) Not currently employed
(d) Retired
(e) Full-time student
(f) Part-time student

What is your approximate average household income? ***[Allow refusal]***
(a) $24,999 or less
(b) $25,000-$49,999
(c) $50,000-$74,999
(d) $75,000-$99,999
(e) $100,000-$124,999
(f) $125,000-$149,999
(g) $150,000-$174,999
(h) $175,000-$199,999
(i) $200,000 and up

What is the approximate distance from your home to the nearest city with a population of at least 100,000 people? *Please give us your best estimate if you are unsure; Select "0-10 miles" if you live within a city with at least 100,000 people.*
(a) 0-10 miles
(b) 11-50 miles
(c) 51-100 miles
(d) over 100 miles