

Consumers and Alternative Fuels: Economics Are Top of Mind

About the Fuels Institute

The Fuels Institute, founded by NACS in 2013, is a non-profit research-oriented think tank dedicated to evaluating the market issues related to consumer vehicles and the fuels that power them. Led by a diverse Board of Directors and driven by a Board of Advisors, the Fuels Institute incorporates the perspective of interested stakeholders affected by this market.

The Fuels Institute commissions and publishes comprehensive, fact-based research projects that address the interests of the affected stakeholders. Such publications will help to inform both business owners considering long-term investment decisions and policymakers considering legislation and regulations affecting the market. For more information visit www.fuelsinstitute.org.

Board of Advisors

(* Denotes individual also serves on Board of Directors)

Bill Douglass (Chairman)*, Douglass Distributing Company

Jay Ricker (Treasurer)*, Ricker's

Brett Barry, Clean Energy

Stephen Brown, Tesoro Corporation

Pete Daily, Delek US Holdings

Mark DeVries*, POET Ethanol Products

Norman Herrera*, Sparq Natural Gas

Tom Kloza, OPIS/Gas Buddy

Max McBrayer*, RaceTrac Petroleum

Jeff Morris*, Alon USA

Ron Sabia*, Gulf Oil, Cumberland Gulf Group of Companies

Robert Stein, Kalibrate Technologies

Norman Turiano*, Turiano Strategic Consulting

Steve Vander Griend, ICM, Inc.

Andy Viens*, Phillips66

Michael Whatley*, Consumer Energy Alliance

Robert Wimmer*, Toyota Motor North America, Inc.

Money matters. After the fanfare that accompanies the introduction of new vehicles or new technology subsidies, consumers are primarily focused on economic factors such as fuel economy and vehicle cost when deciding which vehicle to purchase. Yet while these factors may influence decisions within a certain class of car, they might not necessarily push consumers to change preference for vehicle type, according to a nationwide consumer survey conducted for the Fuels Institute by Penn Schoen Berland.

Understanding consumer preferences is critical for forecasting what the future of personal transportation will look like and for deciding which technologies and fuels should be brought to the market — not to mention when and how. The successful fuel and vehicle technology of the future will be decided by the consumer. The vehicle and fuels industries can produce whatever products they desire, but if the consumer is not interested no product can succeed.

This Fuels Institute survey was fielded to identify the factors most important to consumers when selecting a vehicle to purchase and what their attitudes might be relative to specific alternative fuels and vehicles.

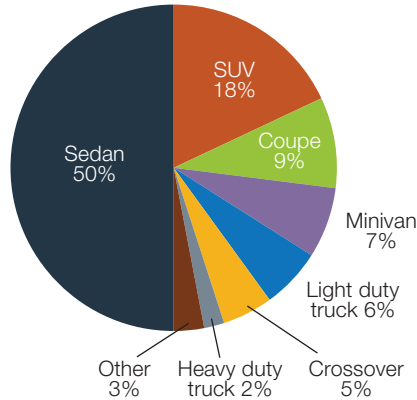
This is the first in a series of reports built from a Fuels Institute survey of 2,007 consumers who purchase fuel at least once per month. The survey was conducted April 4-6, 2014. In this edition, the Fuels Institute presents an overview of consumer attitudes and preferences about vehicles and fuels in general.

Disclaimer: The opinions and views expressed herein do not necessarily state or reflect those of the individuals on the Fuels Institute Board of Directors and the Fuels Institute Board of Advisors, or any contributing organization to the Fuels Institute. The Fuels Institute makes no warranty, express or implied, nor does it assume any legal liability or responsibility for the use of the report or any product, or process described in these materials.

Consumer Profile

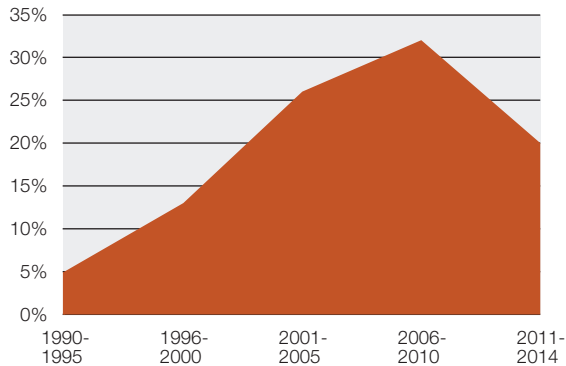
Of the consumers sampled for the survey, half (50%) (Figure 1) said the vehicle they drive most often is a four-door sedan and 18% said they typically drive an SUV.

1: Vehicle Type Currently Driven



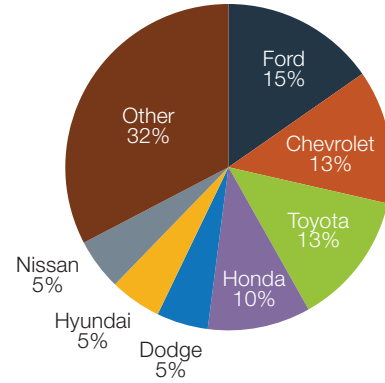
The majority of people drive a more modern vehicle, with 78% claiming their vehicle was manufactured in 2001 or more recently. (This is noteworthy because the U.S. Environmental Protection Agency approves the use of E15 only in model year 2001 and newer vehicles.) No consumers claimed driving a pre-1990 vehicle and only 5% said their vehicle was model year 1991-1995. (Figure 2)

2: Model Year of Vehicles Owned



Ford, Chevrolet, Toyota and Honda dominated the vehicles driven by the sample, representing a combined market share of 51%, with no other brand representing more than 5% of the survey population. (Figure 3)

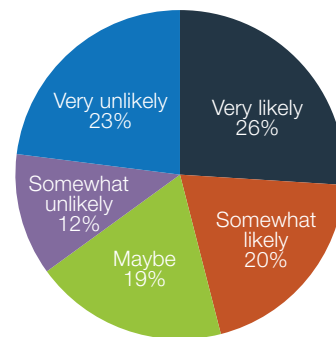
3: Vehicle Brand Currently Driven



Consumers Are Car Shopping

One-quarter of consumers (26%) are very likely to buy a vehicle in the next three years and 20% are somewhat likely to do so, creating a potential population of 46% of consumers in the vehicle market. (Figure 4) (The survey did not distinguish between new or used vehicles.) Despite this interest in buying a car, consistent with surveys conducted in previous years (45% in May 2013, 47% in January 2013 and 38% in January 2012), consumers seem to be hanging on to their vehicles longer. According to R.L. Polk and Company, as of August 2013 the average age of vehicles on the road in the United States was 11.4 years. This is up from an average age of 9.7 years in 2003.¹

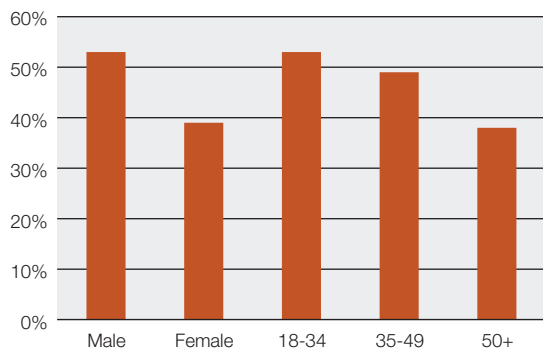
4: Potential to Buy in Three Years



According to the survey, men are more likely to buy a vehicle than are women, with 53% of men very or somewhat likely to purchase compared with only 39% of women. (Figure 5) Yet, a recent survey conducted by C+R Research on behalf of Cars.com indicated that women seem to wield greater influence over vehicle purchase decisions. C+R Research claims that 73% of mothers make the decision in their families.² If this is true, how women perceive certain vehicle options should be of particular interest, especially to those seeking to develop market opportunities.

The survey further found that younger consumers are more likely to purchase a vehicle, with 53% of 18- to 34-year-olds likely or somewhat likely to make a purchase compared with 49% of 35- to 49-year-olds and only 38% of those 50 and older. (Figure 5)

5: Very or Somewhat Likely to Buy

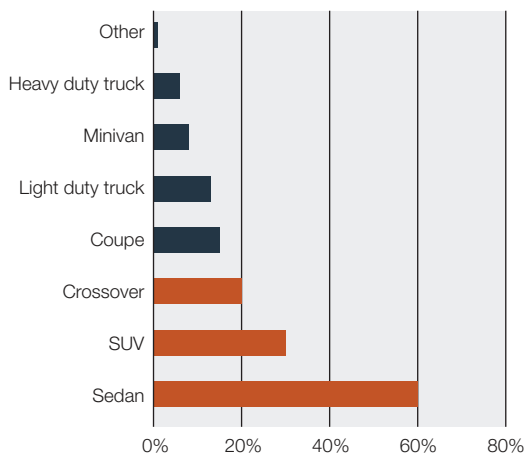


Economics Come Into Play

More than half of consumers say they will consider purchasing a sedan (60%), while half will consider either an SUV (30%) or a crossover (20%) – double the number of those who currently drive these vehicles (23% combined).

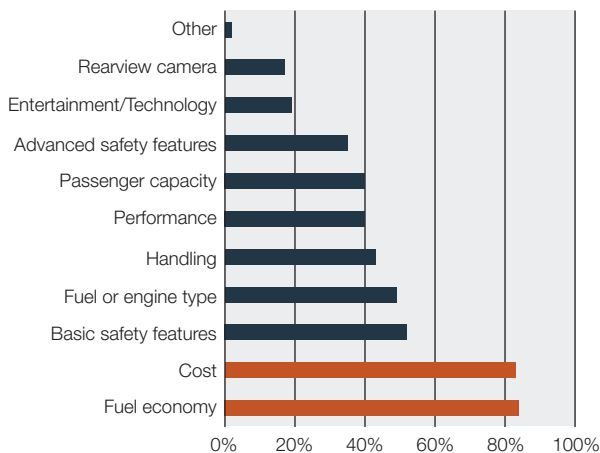
(Figure 6)

6: Vehicle Type Likely to Buy



Interestingly, the attention given these larger vehicles seems to conflict somewhat with the economic attributes claimed to be most influential in the vehicle purchase decision. Consumers overwhelmingly claim to be financially driven, with fuel economy and cost being cited by 84% and 83% of consumers, respectively (Figure 7) – SUVs and crossover utility vehicles (CUVs) are not typically considered to be among the most fuel-efficient vehicles in the market.

7: Most Influential Attributes



¹ <http://www.latimes.com/business/autos/la-fi-hy-polk-car-age-20130806-story.html>

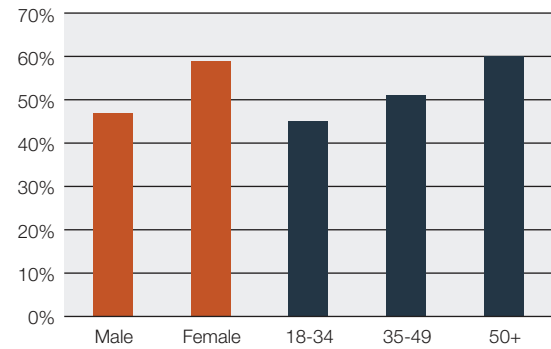
² <http://wardsauto.com/sales-marketing/moms-wield-purchasing-decision-power>

Perhaps this apparent conflict indicates that economic attributes are more directly applied to vehicles within a similar category, rather than suggesting consumers might look to another kind of vehicle to obtain such economic benefit. In other words, an SUV customer might compare cost and fuel economy between several available SUVs, but might not be willing to consider shifting to a smaller vehicle that delivers superior economic value.

Consumers shopping primarily for a specific class of vehicle showed a diversity of preferred vehicle attributes. Those considering smaller vehicles (coupes and sedans) were more likely to cite performance or technological attributes as influential, while those considering larger vehicles (minivans, SUVs and crossovers) found cost, capacity and safety to be more important. (Figure 8)

Falling a distant third to these economic attributes were basic safety features, followed by fuel or engine type. The only notable difference between genders was in the priority attributed to basic safety features, in which women placed a higher priority than did men. These features were also more important to the over-50 age bracket. (Figure 9)

9: Basic Safety Features

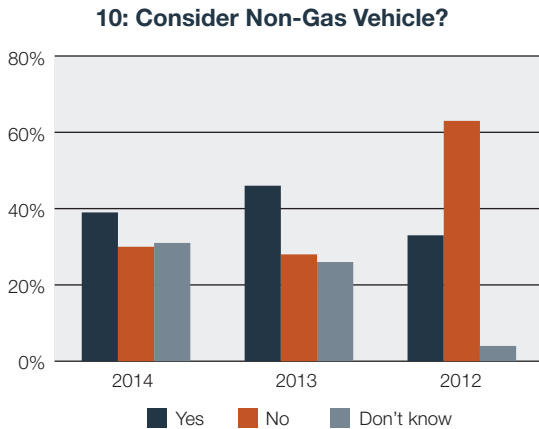


8: When considering a new vehicle purchase, which vehicle attributes are most influential to your decision? Please select all that apply.

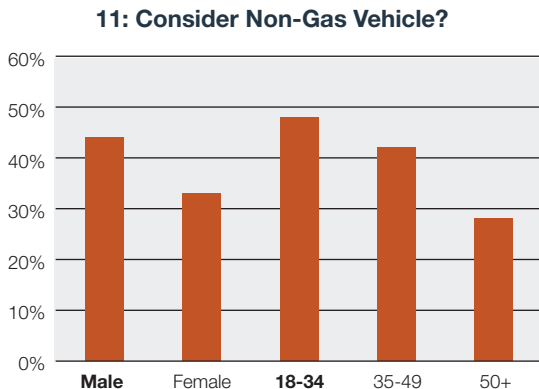
(% Gas purchasers)	All	Potential Buyer					
		Coupe	Sedan	Truck	Minivan	SUV	Crossover
Fuel economy	83%	81%	88%	80%	87%	84%	91%
Cost	81%	78%	82%	82%	81%	84%	90%
Basic safety features (Front/Side airbags, etc.)	51%	45%	51%	45%	62%	59%	63%
Fuel or engine type (Diesel/Gasoline/Hybrid)	48%	48%	45%	49%	55%	56%	62%
Handling	43%	51%	43%	46%	50%	47%	54%
Passenger capacity	40%	23%	38%	43%	65%	54%	56%
Performance (horsepower)	40%	53%	39%	51%	45%	45%	45%
Advanced safety features (blind spot detection, adaptive cruise control, etc.)	34%	31%	34%	24%	41%	46%	45%
Driver entertainment/technology	21%	27%	20%	23%	27%	27%	25%
Rearview camera	17%	15%	15%	12%	23%	23%	25%
Other	2%	1%	1%	3%	1%	3%	2%

Opposition to Alternative Vehicles Wanes

Of those who said they are likely to buy a vehicle in the next three years, 39% said they would consider a non-gasoline vehicle. This is down from 2013 (46%) but up from 2012 (33%). Worth noting is a significant drop in opposition to non-gas vehicles since 2012. In that survey, nearly two-thirds of consumers (63%) were not interested in considering a non-gas vehicle. Today, less than one-third (30%) are so disinclined. (Figure 10)



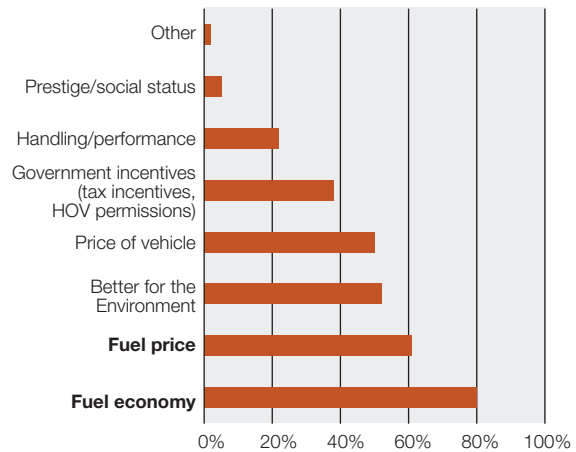
When considering the data through a marketing lens, men are more likely to consider a non-gas vehicle than are women, by a 44% to 33% difference. In addition, younger drivers are more interested in new vehicle fuel technologies, with 48% of the 18- to 34-year age bracket likely to consider a non-gas vehicle. (Figure 11)



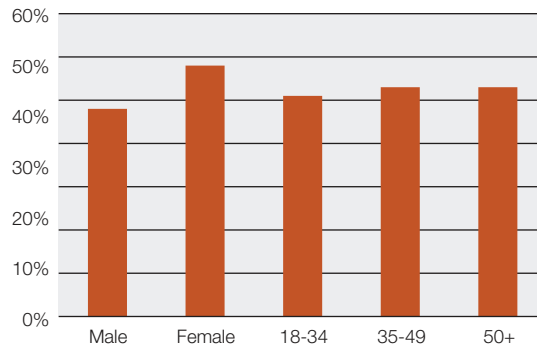
Consistent with the interests of vehicle buyers in general, among those who would consider a non-gas vehicle, the primary attribute that would lead them to purchase was fuel economy, cited by 80% of consumers, followed by fuel price. If these economic factors are so influential, and if the perception is that alternative fuel vehicles deliver superior fuel efficiency, it is unclear what accounts for the 7% decline in consumer interest. It's a question worthy of additional study as the results of this survey do not provide sufficient data to answer.

Another factor often used to promote alternative fuel vehicles is their reputed ability to reduce the impact of transportation on the environment. However, among the primary attributes that contribute to the interest in alternative fuel vehicles, the environment came in third. (Figure 12) Only 52% of consumers cited it as a motivation to consider alternative vehicles, with women seemingly more environmentally driven than men by a margin of 58% to 48%. Surprisingly, there was no variation in this category by age group. (Figure 13)

12: Attributes of Non-Gas Vehicles



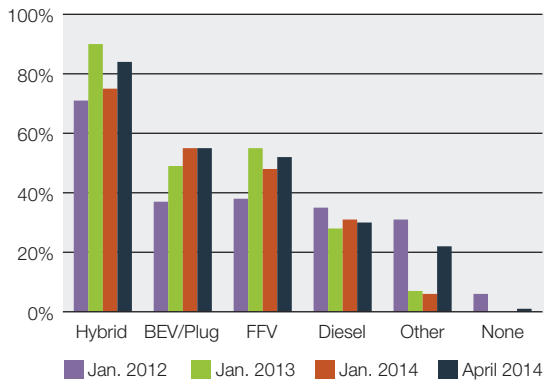
13: Better for the Environment



Also surprising was the lack of importance of government incentives, such as tax credits and HOV permissions. Only 38% noted these as important in their desire to consider a non-gas vehicle. However, these factors seem more important to those 50 and older, 53% of whom identified government incentives as important to their decision.

Of those who would consider buying a non-gas vehicle, interest and preference in particular technology types have not changed dramatically over a four-year period of surveys. In this survey, 84% said they would consider a hybrid vehicle, which was consistent across genders and age groups. This also is consistent with responses in previous surveys, in which consumer interest in hybrids ranged from 71% to 90%. (Figure 14)

14: Interest in Technology



Interest in electric vehicles (defined as all electric or plug-in hybrids) has shown significant growth in the past few years, with more than half (55%) indicating interest in this technology. This is up from only 37% of consumers who said they were interested in electric vehicles in 2012. Not surprisingly, the younger age groups seem more open to this technology than those age 50 and older. (Figure 15)

Flex fuel vehicles were of consideration for 52% of consumers, with some regional diversity – the Midwest and South led the interested regions at 57% and 58%, respectively. Diesel fuel was cited by 30% of consumers while 22% said they would consider other alternatives like propane and natural gas. (Because of the technology’s limited presence in the market, hydrogen fuel cell vehicles were not listed as a response option to this question.)

15: For your next car purchase, would you consider buying any of the following types of vehicles?

(% Gas consumers)	Gender		Age			
	M	F	18-34	35-49	50+	
Hybrid – electric and gas	85%	83%	86%	83%	87%	82%
Electric – all electric or plug-in vehicles	55%	56%	54%	60%	58%	45%
Flex fuel – can use gas or gasoline blends containing up to 85% ethanol	52%	55%	48%	52%	56%	48%
Diesel fuel	30%	35%	24%	29%	30%	33%
Other alternative – propane, natural gas	22%	25%	17%	20%	19%	28%
None of the above	1%	1%	0	1%	1%	2%

Summary

The general observation from this survey is a clearer understanding of the relative importance of economic value to the consumer. However, how consumer preference is applied to various alternative fuels and vehicles can vary from technology to technology.

In the next several reports, the Fuels Institute will look more closely at consumer perceptions about non-gasoline vehicle alternatives, including diesel fuel, ethanol fuels, battery electric vehicles, natural gas vehicles and hydrogen fuel cell electric vehicles.

Appendix A: Project Funding

The Fuels Institute strives to provide fact-based analysis that contributes to the better understanding of fuels and vehicles market issues. In order to deliver credible reports, the Board of Directors believes it is critical that the operations of the Fuels Institute be as transparent as possible and disclose financial resources and research methodologies that are used to complete specific work products.

This specific project is funded through general contributions, both direct financial and in-kind, to the Fuels Institute. These funds are incorporated into the operating budget of the organization and this project was funded directly from that budget. Below is a list of organizations that support the Fuels Institute.

Platinum Contributors

NACS
Tesoro Companies, Inc.

Gold Contributors

Chesapeake Energy Corporation
Clean Energy Fuels
Consumer Energy Alliance
Delek US Holdings dba MAPCO Express, Inc.
ICM, Inc.
Kalibrate Technologies
OPIS/Gas Buddy
Phillips 66 Company
POET Ethanol Products
Toyota Motor Company

Silver Contributors

VeriFone, Inc.

Bronze Contributors

Bennett Pump Company

Association Partners

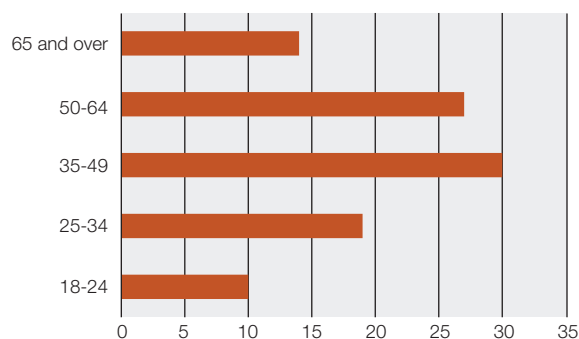
CA Fuel Cell Partnership
Diesel Technology Forum
Growth Energy
NATSO
NGV America
Petroleum Equipment Institute
Petroleum Marketers Association of America
Renewable Fuels Association

Appendix B: Survey Methodology

Penn Schoen Berland conducted online interviews on April 4-6, 2014 among 2,007 American adults who purchase gasoline for a vehicle, such as a car, truck, or van at least once a month.

The margin of error for this study is +/- 2.19% at the 95% confidence level and larger for subgroups. Some percentages may add to more or less than 100% due to rounding.

Age of Consumers Profiled



Below are the actual survey questions fielded by Penn Schoen Berland that were used to prepare this specific report. Additional questions fielded in this survey will be presented in subsequent reports, as relevant to the subject matter evaluated.

13. How likely are you to buy a vehicle (car, SUV, truck, etc.) in the next three years?
- 1) Very likely to buy a vehicle
 - 2) Somewhat likely to buy a vehicle
 - 3) Might or might not buy a vehicle
 - 4) Somewhat unlikely to buy a vehicle
 - 5) Very unlikely to buy a vehicle
14. **## IF Q13 = C1-3 ##** What type of vehicle are you considering purchasing? Please select all that apply. **/* MULTIPLE RESPONSES PERMITTED */**
- 1) Coupe (2-door)
 - 2) Sedan (4-door)
 - 3) Light duty truck (payload capacity of less than 4,000 lbs.)
 - 4) Heavy duty truck (payload capacity of more than 4,000 lbs.)
 - 5) Minivan
 - 6) SUV
 - 7) Crossover (crossover between SUV and sedan)
 - 8) Other **/* SPECIFY */ /* EXCLUSIVE */**

-
15. **## IF Q13 = C1-3 ##** When considering a new vehicle purchase, which vehicle attributes are most influential to your decision? Please select all that apply.
/* MULTIPLE RESPONSES PERMITTED */
- 1) Performance (horsepower)
 - 2) Handling
 - 3) Fuel economy
 - 4) Passenger capacity
 - 5) Driver entertainment/technology
 - 6) Cost
 - 7) Advanced safety features (blind spot detection, adaptive cruise control, etc.)
 - 8) Basic safety features (Front / Side airbags, etc.)
 - 9) Rearview camera
 - 10) Fuel or engine type (Diesel/Gasoline/Hybrid)
 - 11) Other **/* SPECIFY */**
16. **## IF Q13 = C1-3 ##** When considering a new vehicle purchase, what vehicle attribute is the most influential to your decision? **## ONLY SHOW RESPONSES SELECTED IN PREVIOUS QUESTION ##**
- 1) Performance (horsepower)
 - 2) Handling
 - 3) Fuel economy
 - 4) Passenger capacity
 - 5) Driver entertainment/technology
 - 6) Cost
 - 7) Advanced safety features (blind spot detection, adaptive cruise control, etc.)
 - 8) Basic safety features (Front/Side airbags, etc.)
 - 9) Rearview camera
 - 10) Fuel or engine type (Diesel/Gasoline/Hybrid)
 - 11) **## INSERT Q16 CH15 ##**
17. **## IF Q13 = C1-3 ##** Would you consider buying a non-gas vehicle?
- 1) Yes
 - 2) No
 - 3) Don't know
18. **## IF Q17 = CH1 ##** What attributes would lead you to purchase a non-gas vehicle? Please select all that apply.
/* MULTIPLE RESPONSES PERMITTED */
- 1) Fuel economy
 - 2) Better for the environment
 - 3) Prestige / social status
 - 4) Handling/performance
 - 5) Price of vehicle
 - 6) Government incentives (tax incentives, HOV permissions)
 - 7) Fuel Price
 - 8) Other **/* SPECIFY */**
19. **## IF Q17 = CH1 ##** For your next car purchase, would you consider buying any of the following types of vehicles? **/* RANDOM ROTATE CHOICES */**
/* MULTIPLE RESPONSES PERMITTED */
- 1) Flex fuel – can use gas or gasoline blends containing up to 85% ethanol
 - 2) Electric – all electric or plug-in vehicles
 - 3) Hybrid – electric and gas
 - 4) Diesel fuel
 - 5) Other alternative – propane, natural gas
/* SPECIFY */
 - 6) None of the above **/* EXCLUSIVE */** **/* DO NOT ROTATE */**