

A STUDY OF FACTORS AFFECTING AUTOMOBILE DRIVERS' DECISION ON
DECLINING TO USE GASOHOL

A MASTER'S PROJECT

BY

ARPORN PIPATTAM

Presented in Partial Fulfillment of the Requirements for the
Master of Arts Degree in Business English for International Communication

at Srinakharinwirot University

March 2008

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ABSTRACT

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อาภรณ์ พิพัฒนธรรม (2551). การศึกษาปัจจัยที่ส่งผลกระทบต่อการใช้แก๊สโซฮอลล์ของ

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กรุงเทพฯ: บัณฑิตวิทยาลัย มหาวิทยาลัยศรีนครินทรวิโรฒ. อาจารย์ที่ปรึกษาสารนิพนธ์:

อาจารย์โสภณ จันทะคล้อย.

สารนิพนธ์ฉบับนี้มีจุดประสงค์เพื่อศึกษาถึงปัจจัยที่ส่งผลกระทบต่อการใช้แก๊สโซฮอลล์ของผู้ขับซีรยนต์ในเขตกรุงเทพมหานคร ทศนคติและความเข้าใจของผู้ขับซีรยนต์ที่มีต่อแก๊สโซฮอลล์ และแนวโน้มการตัดสินใจในอนาคตของผู้ขับซีรยนต์เหล่านั้น โดยใช้วิธีการสุ่มตัวอย่างจากผู้ขับซีรยนต์ในเขตกรุงเทพมหานคร จำนวน 50 คน ทั้งผู้ที่เติมน้ำมันเบนซินนอกเทน 91 และนอกเทน 95 โดยกลุ่มตัวอย่างตอบแบบสอบถาม และผู้วิจัยนำข้อมูลที่ได้รับมาวิเคราะห์ผลโดยใช้ค่าความถี่ และค่าร้อยละ

ผลการศึกษาพบว่า ปัจจัยสำคัญที่มีผลกระทบต่อการใช้แก๊สโซฮอลล์ของผู้ขับซีรยนต์มีดังนี้ 1) ค่าใช้จ่ายในการปรับแต่งเครื่องยนต์เพื่อให้รองรับการใช้แก๊สโซฮอลล์ 2) ราคาแก๊สโซฮอลล์ และ 3) การรับประกันคุณภาพของแก๊สโซฮอลล์โดยบริษัทผู้ผลิตรถยนต์ชั้นนำ

การศึกษาถึงแนวโน้มการเลือกใช้น้ำมันในอนาคตของผู้ตอบแบบสอบถาม ผลการศึกษาพบว่าผู้ขับซีรยนต์ส่วนใหญ่มีแนวโน้มที่จะเติมน้ำมันเบนซินในอนาคต ด้วยเหตุผลตามลำดับดังนี้ คือเมื่อราคาของแก๊สโซฮอลล์ถูกกว่าน้ำมันเบนซิน 20% เมื่อไม่มีน้ำมันเบนซินจำหน่ายในตลาด และเมื่อผลการวิจัยเกี่ยวกับแก๊สโซฮอลล์มีความน่าเชื่อถือ

กลุ่มของผู้ตอบแบบสอบถามที่มีแนวโน้มจะไม่ใช้แก๊สโซฮอลล์ในอนาคต ด้วยเหตุผลตามลำดับดังนี้คือ ราคาของแก๊สโซฮอลล์และน้ำมันเบนซินไม่แตกต่างกัน ยังคงมีน้ำมันเบนซินจำหน่ายอยู่ในตลาด และผลการวิจัยเกี่ยวกับแก๊สโซฮอลล์ไม่น่าเชื่อถือ

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This study was aimed to explore the factors affecting automobile drivers' decision on declining to use gasohol, their understanding and attitude towards gasohol, and their decision on using or declining to use gasohol in the future. Fifty automobile drivers in Bangkok area who fueled their car with benzene octane 91 or octane 95 were randomly selected to respond to the questionnaire in July 2007. The data were analyzed by using the frequency and percentage.

The results of the study revealed that three major factors affecting drivers' decision on declining to use gasohol were: 1) the expenses in tuning up car engine if it did not properly work when using gasohol, 2) high gasohol price, and 3) gasohol quality guaranteed by the world's leading automobile companies.

Furthermore, the findings showed that the majority of the respondents would use gasohol in the future because of three reasons. Firstly, gasohol price was 20% lower than benzene price, secondly, benzene was not available in the market, and thirdly, there was more research result concerning gasohol quality. Meanwhile, there were some respondents who would not use gasohol in the future due to three reasons: 1) gasohol price is not different from benzene price; 2) benzene is available in the market; and 3) the research result concerning gasohol quality is not reliable.

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The Master's Project Advisor, Chair of Business English for International Communication Program, and Oral Defense Committee have approved this Master's Project *A Study of Factors Affecting Automobile Drivers' Decision on Declining to Use Gasohol* by Ms. Arporn Pipattam) as partial fulfillment of the requirements of the Master of Arts Degree in Business English for International Communication of Srinakharinwirot University.

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CHAPTER 1

INTRODUCTION

Background

Oil plays such a fundamental role in the world economy since world's oil production has been declining since 1970 due to natural resource limitations.

The problem, however, is not “running out of oil”. Rather, it is “running out of cheap oil”. Demand for energy is increasing dramatically. The spread between supply and demand will cause higher prices for all products. The rising price of oil is already damaging many parts of the business world. What happens when there is not enough oil to keep up with the current growing human population? In the future, oil production will decrease at the same time demand increases. As people move into the middle class, they want to buy cars, TVs, air conditioners, and other products that use oil and electricity. Exxon Mobil, the world's largest merged oil company engages in oil and gas exploration, production, supply, transportation, and marketing around the world, predicted that worldwide demand will have grown by 40% by 2020 (*Mankind's Annual Oil Consumption = more than one cubic mile.* 2006: Online).

The sustained rise in oil price has forced all countries both developed and developing countries, especially ones that mostly depend on imported oil including Thailand, to seek more efficient and cheaper sources of alternative energy. If we want to protect future generations and themselves against energy shortages and higher energy prices, then we need to reduce their dependence on importing oil since fuel shortages may occur at any

time due to hostile actions by foreign nations and because of over consumption. People who experience higher prices for oil learn more about the sources of the energy because oil prices cannot be controlled. These experiences often lead people to choose more economical solutions, and their personal choices often include alternative energy use. Lessons from history suggest that high oil prices mean bad news for the economy.

In Thailand, alternative energy source has played a very important role and becomes the talk of the town since his Majesty the King addressed the problem related to the oil supply scarcity and the falling crop prices. In 1985, gasohol was originated by the Royal Project of King Bhumibol. This project is about a study on gasohol production as an alternative source by producing ethanol – a kind of alcohol that can be produced domestically from crop fermentation by converting starch into sugar and then converting sugar into alcohol (*How to produce ethanol*. 2006: Online). Also, the distillation of alcohol from different kinds of sugarcane, rice, corn, and tapioca attained a pure alcohol of 95 percent, which is called ethanol. Later on, it was introduced to the public and private sectors for testing with engines. A year later, the first sugarcane-derived alcohol started flowing from the Royal Chitralada Project (RCP), and the development of gasohol has been carried out by several private and government organizations. In 1996, Petroleum Authority of Thailand and Thailand Institute of Scientific and Technological Research joined RCP in the project focusing on the improvement of the gasohol quality. They took the 95% pure alcohol from RCP and purified it to become 99.5% purity. Gasohol is the combination of 99.5% of pure ethyl alcohol and unleaded gasoline with 91 research octane number or (RON), mixed at the ratio of 1:9. The capacity of gasohol is similar to that of 95-octane unleaded petrol. In gasohol, the ethyl alcohol serves as an additive to enhance oxygenate

value and octane number of gasoline, which was normally rendered by Methyl Tertiary Butyl Ether (MTBE), an imported chemical. In 2000, PTT carried out several experiments on fueling gasohol in cars, and the studies showed that gasohol helps reducing the pollution, saves energy, and does not affect the car performance.

To recap, the high prices for oil nowadays are creating a widespread awareness that there is not enough oil being pumped today to supply everyone. Therefore, overcoming this problem is to find an alternative fuel. One of the best solutions is Gasohol.

Statement of the problem

A number of countries prefer to use gasohol because it is environment-friendly and it is a low cost product, but they experience the problem of resource scarcity. Some of the fuel providers explained that they had difficulty acquiring a steady supply of gasohol because of the small amount of available ethanol. In addition, the higher cost of producing, transporting, and storing gasohol may limit the profitability of selling gasohol when compared to gasoline. Moreover, some of the fuel providers reported that their areas contained no sources of ethanol or gasohol.

Table 1 Fuel consumption of Thai drivers from January-October, 2005-2006

Unit: Million liters

Fuel Type	January – October	
	2005	2006
Benzene	19.851	19.589
Benzene octane 91 & 95	18.309	16.116
Gasohol	1.542	3.472

Source: Department of Energy Business, Ministry of Energy

The consumption statistics in Table 1 shows that total gasohol consumption from January to October is at 3.472 million liters, while total benzene octane 91 and 95 consumption of the same period is at 16.116 million liters (กรมธุรกิจพลังงาน. 2006: Online). It is obvious that gasohol is not quite popular among Thai drivers although the Thai government has been working closely with the private sector to educate the public about the benefits of gasohol. Moreover, on March 29, 2005, the Ministry of Energy (MOEN) cooperated with the world's leading car companies to guarantee that the use of gasohol would not have any negative impact on car engines and to inform motorists that they could immediately fill their tanks with gasohol without the need for any engine modification. The price of gasohol has been set at a lower rate, which is 3.50 Baht cheaper than 95-octane benzene per liters as of July 19, 2007. Obviously, the Thai government tries to promote alternative fuels and conserve energy because it is one of the best solutions to cope with the expensive oil prices and the uncertainties of the global oil situation. However, some

drivers still hesitate to fill their cars with gasohol, and surprisingly although our country has plenty of local resources available to produce ethanol for domestic use, some of the consumers seem to be willing to pay for the more expensive choice. This is quite questionable whether the attempt to promote the using of gasohol, an alternative fuel, by the government and the private sector can be achieved.

To sum up, it is interesting to study the factors affecting drivers' decision on declining to use gasohol and to explore the consumers' decision on using gasohol in the future.

Objectives of the study

1. To study what factors affect drivers on declining to use gasohol.
2. To explore if these drivers will use gasohol in the future.

Research questions

The research questions for this study were:

1. What factors affected drivers on declining to use gasohol?
2. Would these drivers decide to use gasohol in the future? Why/ Why not?

Significance of the study

This study revealed the factors influencing drivers' decision and the reasons why they declined to use gasohol and the trend of using in the future. The findings of this study would be beneficial for manufacturers to develop their products and the image of the

product. Readers of this study would benefit from a better understanding of gasohol and realize that our country was more economical on fuel consuming by reducing importing oil. Not only would gasohol reduce our dependence on expensive fuels and crude oil, but producing ethanol would also benefit our farmers and our agricultural sector in the long run. Furthermore, gasohol also helped improve the environment as the improved combustion of the engine released 20 to 25% lower hydrocarbon and carbon monoxide emission (*Benefit of gasohol*. 2006: Online).

In sum, the results of this study would provide factors relating to the drivers' decision on choosing to use gasohol, and using gasohol would benefit drivers, the country, the agriculture sector and the environment.

Scope of the study

This study attempted to explore the the factors affecting drivers' decision on declining to use gasohol and whether they would use gasohol in the future. The researcher applied related theories concerning consumer decision making processes and factors influencing consumer behaviors to find out the causes that affected the drivers on declining to use gasohol.

This study dealt with fifty automobile drivers in Bangkok who fueled their car with benzene octane 91 or 95. The researcher did not limit the range of the informants' age, career, and educational background. The research was conducted in July 2007. The selected petrol stations were those where drivers could choose to fuel their car with either benzene or gasohol.

Definition of terms

Drivers	People who fuel their car with benzene
Benzene	A kind of unleaded petrol mixed with the MTBE (Methyl-tertiary-butyl-butyl - Ether)
MTBE	MTBE stands for Methyl-Tertiary-Butyl-Ether. MTBE in gasoline serves as an additive to enhance oxygenate value and octane number of gasoline.
Gasohol	A blend of gasoline and ethanol used as motor fuel.
Ethanol	A kind of alcohol produced from crop fermentation, converting starch into sugar and then converting sugar into alcohol. Pure alcohol is ethanol. Ethanol can either be extracted from corn, sugarcane, cassava or other grains e.g. sorghum, rice, etc. Ethanol for blending with oil to fill in the car engine is 99.5% purity alcohol.

CHAPTER 2

REVIEW OF RELATED LITERATURE

This chapter consists of six major sections as follows:

1. The consumers' decision-making process
2. Factors influencing consumer behavior
3. The buyers' decision process for new products
4. Risks and uncertainties
5. Gasohol background
6. Previous related research.

1. Consumer decision-making process

Schiffman & Kanuk (1991:550) state that a decision is the selection of an action from two or more alternative choices. In order for a person to make a decision, there must be a choice of alternatives available. If a person has a choice between making a purchase and not making a purchase, or a choice between brand X and brand Y, we can say that this person is in a position to make a decision. Harrison (1999:10) indicates that decision-making occurs at several levels. The first and perhaps the most basic level is that of the individual act to satisfy his or her psychological needs. Solomon (1999:69) concludes that consumers' purchase is a response to a problem or need for a product. The consumer moves through five stages when making a purchase decision. Kotler (2003:204) explain

that five stages of the purchasing process include need recognition, information search, evaluation of alternatives, purchase decision, and post purchase behavior (See figure 1).

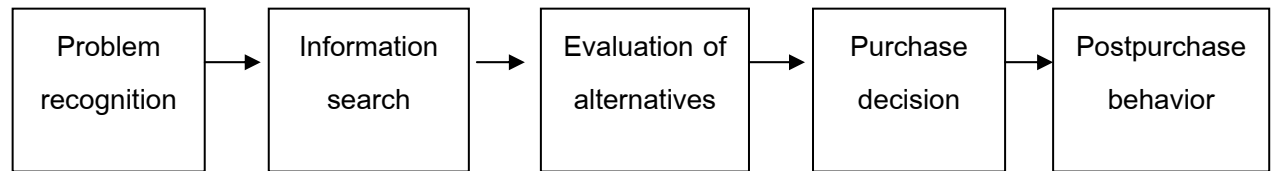


FIGURE 1 Five-Stage Model of the Buying Process

Source: Kotler, Philip. (2003). *Marketing Management*. p. 204.

The buying process starts when the buyers recognize a problem or need. Schiffman & Kanuk (1991:560) argue that need or problem recognition can be viewed as either simple or complex. Simple problem recognition refers to needs that occur frequently and can be dealt with almost automatically, such as becoming thirsty and purchasing a can of softdrink from a vending machine. On the contrary, complex problem recognition, however, is characterized as a state in which a problem develops overtime. For example, after several years of driving a car, the owner may begin to consider trading it in for a new one to avoid growing repair bills.

Wilkinson & Campbell (1997:85) also mention that people should spend the necessary time in making decision and effort seeking clarification of the issues involved, searching for relevant information about consequences of the alternatives from family, various media, other people, and taking other steps in order to arrive at a decision. Making a selection from a sample of all possible brands or evaluation of alternative is a human characteristic that helps simplify the decision-making process. Then consumers make two

types of purchasing: trial purchases and repeat purchases. A trial is an exploratory phase of purchase behavior in which consumers attempt to evaluate a product through direct use.

Repeat purchase behavior is closely related to the concept of brand loyalty which the product meets with the consumer's approval and the consumer is willing to use the same product again. Kotler (2003: 208) states that after purchasing the product, the consumer will experience some level of satisfaction or dissatisfaction.

Solomon (1999: 270) explains that sometimes the decision-making process is almost automatic and based on very little information. Sometimes, the consumer may spend days or weeks thinking about an important purchase such as a new home.

In the conclusion, each purchasing process consist of five stages including need recognition, information search, evaluation of alternatives, purchase decision, and post purchasing behavior.

2. Factors influencing consumer behavior

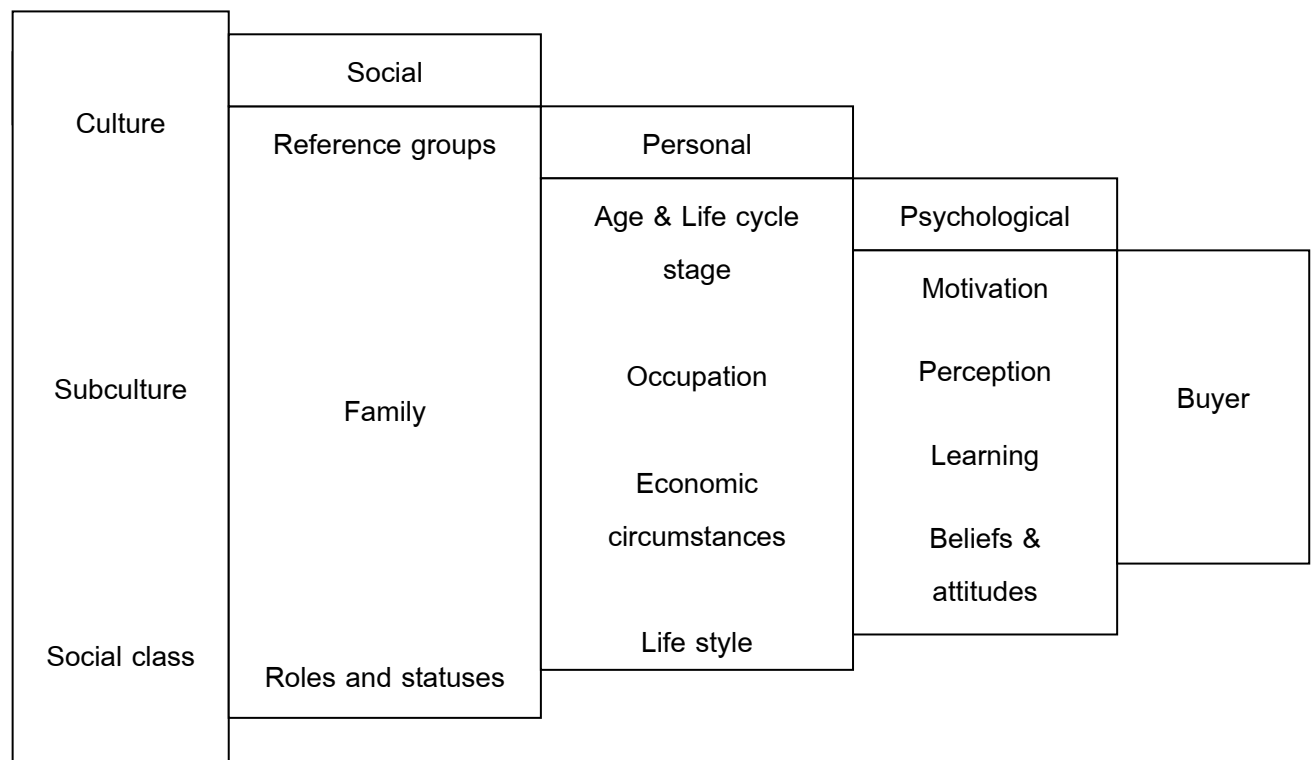


FIGURE 2 Model of Factors Influencing Consumer Behavior

Source: Kotler, Philip. (1991). *Marketing Management* p. 165

Kotler (1991: 164) indicates that a buyer's purchase decisions are influenced by buyer's cultural, social, personal, and psychological factors. Culture is the most fundamental determinant of a person's wants and behavior. Each culture consists of smaller subcultures that provide more specific identification and socialization for its members. For example, computer is necessary for a person who works in the metropolitan area meanwhile, in another culture e.g. a remote tribe in the north of Thailand, a computer means nothing. Social classes are relatively homogeneous and enduring divisions in a society, which are hierarchically ordered and whose members share values, interests, and

behavior. The second factor is social factors, which are reference groups e.g. family, friends, neighbors and coworkers. Kotler (1991:168) also mentions that family members are the most influential primary. At the same time, a family member's influence can vary with different sub decisions made within a product category. A person participates in many groups throughout life family, clubs, and organizations. The person's position in each group can be defined in terms of role and status. People choose products that communicate their role and status in the society; for example, company presidents drive a Mercedes, wear expensive custom-tailored suits, and drink Chivas Regal Scotch. Buyer's decisions are also influenced by his/her characteristics e.g. age and life-cycle stage, occupation, economic circumstances, life, and personality and self-concept. Kotler (1991:174) indicates that the last factor is psychological factor: motivation, perception, learning and belief and attitudes.

Lusch & Lusch (1949:121) state that consumer decisions are influenced by three broad factors: sociological factors, psychological factors and economic factors (See figure 3).

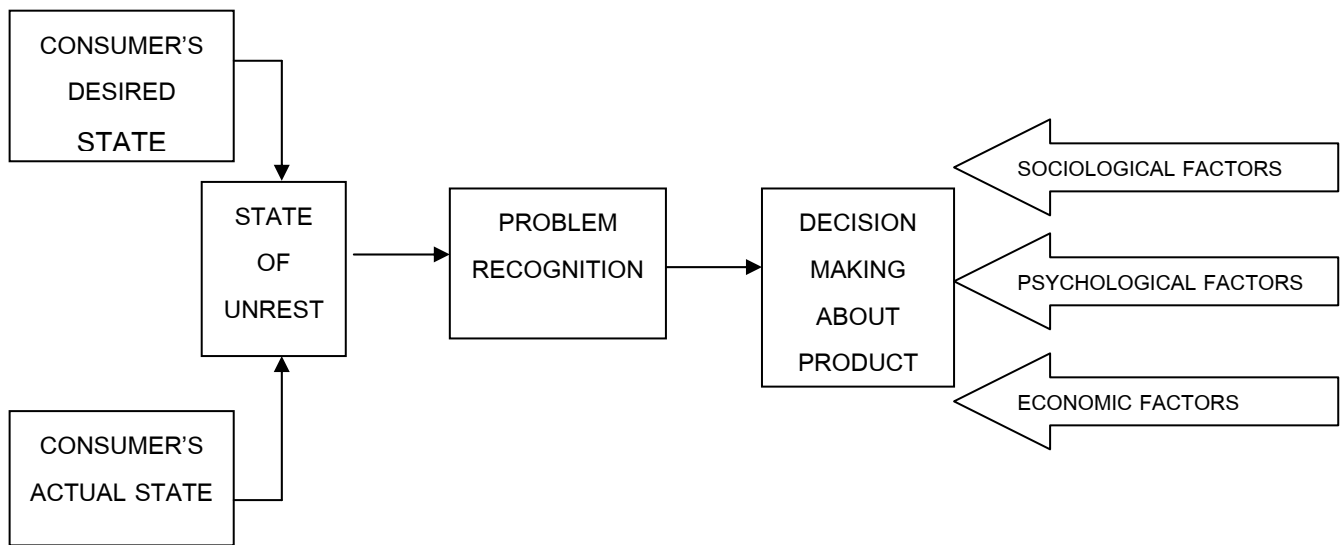


FIGURE 3 Basic Model of Consumer Behavior

Source: Lusch, Robert F., & Lusch Virginia N. (1949). *Principles of Marketing*. p. 124.

Lusch & Lusch (1949: 124) describe the three factors influencing consumer decision as follows:

1. Sociological factors

Sociological factors consist of a wide range of noncommercial influences e.g. the comment from friends, an editorial in the newspaper, usage by a family member. In addition, Lusch & Lusch (1949:123) indicate that a major impact on a consumer's purchasing decision is based on four sociological factors: culture, social classes, family, and reference groups.

Culture is a set of beliefs, attitudes, customs, and institutes created by people to help them explain and cope with their environment. Social class can be defined as a group of people with similar levels of prestige. Social classes reflect not only income, but also other indicators such as occupation, education and area of residence. Kotler (2003: 184)

mentions about family as the most important and continuous sources of group influence on consumer decision-making while reference groups consist of all the groups that have a direct (face-to-face) or indirect on the person's attitudes or behavior.

2. Psychological factors

The second group of factor is psychological factors, which are comprised of attitude, learning processes, motivation and perception. Psychological factors are internal to the individual's thought processes. There are four majors in this group: motivation, perception, learning and beliefs, and attitude. Motive is a need that is sufficiently pressing to drive the person to act. Assael (1990:125) mention that perceptions are the way consumers organize and interpret information about objects like brands and companies. Perception can be defined as the process of receiving and deriving meaning from stimuli present in the environment. Engel; Blackwell; & Miniard (1993) mention that learning is the process which experience leads to changes in knowledge, attitude and behavior. Learning theorists believe that learning is produced through the interplay of drivers, stimuli cues, responses, and reinforcement. A belief is a descriptive thought that a person holds about something; for example, people believe that France could make a fine perfume. An attitude can be viewed as "a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object." (Lusch & Lusch.1949:132).

3. Economic factors

The last factor that influences consumer decision is economic factors. Economic factors concern with the influence of a person's income and other economic resources on purchasing behavior. For example, if consumers believe the economy is unhealthy as a result of high inflation, then they tend to save for an uncertain future.

3. The buyer decision process for new products

Kotler and Armstrong (1999:156-157) state that "a new product is a good, service, or idea that is perceived by some potential customer as new". Consumers learn about products for the first time and make decisions on whether to adopt them. There are five stages in the process of adopting a new product. The first stage is when consumer becomes aware of the new product, but they lack information about it. Then consumer seeks information about the new product. After consumer considers whether trying the new product makes sense, he/she tries the new product on a small scale to approve of its value. The final stage is adoption and consumer decides to make full and regular use of the new product. The characteristics of the new product affect its rate of adoption. Some products catch on almost overnight, whereas others take a long time to gain acceptance because of risk and uncertainty. Engel; Kollat; & Blackwell (1968: 569) explain that word-of-mouth, or personal communications are important influences in the acceptance of the new product. The individual seeking information turns either to someone who has already purchased the new product or to an expert.

4. Risk and uncertainty

Kotler (2003: 207) states that there are many factors affecting consumers' decision such as product characteristic, attitude, situation, and environment. In terms of the new product, consumers are hesitating to make a decision. A consumer's decision to modify, postpone, or avoid a purchase decision is heavily influenced by perceived risks. Engel; Kollat; & Blackwell (1968) support that risks may be financial, physical, social, or combination of the three. Therefore, another major factor affecting consumer's decision is risk and uncertainty. Jones (2004: 46) describes that uncertainty refers to outcome of which estimates have been made but no probabilities because there is no experience to guide decision makers about possible outcomes. The important factor associated with the purchase decision process is the level of risk perceived by the buyer. Solomon (1999:280) states that perceived risk may be present if the product is expensive or is complex and hard to understand. Risk is perceived because the buyer has little or no experience of the performance of the product or the decision process associated with the product. Wilkinson & Campbell (1997:85) explain that even the best decisions could sometimes lead to unsatisfactory outcomes because the world is full of uncertainties. Fill (1995: 119-120) points out the ways to reduce the level of perceived risks are the use of guarantees, third party endorsements, information through the mass media and word of mouth. For example, leading car manufacturers guarantee the quality of gasohol, Thai government promotes the use of gasohol through the mass media e.g. newspaper, broadcasting media, etc.

5. Gasohol Background

Gasohol has been sold in foreign countries for several decades. Currently, at least 35 countries have launched experiments and produced gasohol for sale as an alternative fuel to gasoline from crude oil. Gasohol has been widely used in Brazil; about 12 billion liters of ethanol is used for blending with gasoline each year. Brazil is a gasohol leader. This country has been seriously promoting the use of gasohol as alternative fuel since the government resolved to reduce the import of oil.

5.1 Gasohol in Thailand

Thailand first produced gasohol in 1981. Since then, several studies on gasohol were carried out until its production became commercially viable.

In 1981, Thailand Institute of Scientific and Technological Research built a prototype of alcohol distilling factory, capable of producing 99.5 percent pure alcohol. In 1985, His Majesty the King Bhumibol Adulyadej's Chitralada Project started to distil fuel for gasohol production. In this project, His Majesty initiated a study and an experiment on how to process sugarcane into alcohol that could be used as fuel. Both the public and private sectors have followed His Majesty's initiative and have begun dedicating their research-and-development effort to alternative fuel since then. In early 2001, the commercial sale of gasohol began. Pure ethanol of 99.5 percent concentration was used instead of Methyl-Tertiary-Butyl-Ether (MTBE) to blend with gasoline at the rate of ethanol: gasoline 10:90 to produce octane 95 gasohol. In 2003, the government promoted the use of ethanol by exempting excise tax for ethanol producers. The government also subsidized oil companies

by reducing the Oil Fund and the Energy Conservation Fund (ENCON Fund) for gasohol. Moreover, the government, oil companies and auto manufactures cooperated in launching awareness campaigns to create confidence in the use of gasohol among motorists and members of the public. Gasohol is safe for the car models which have been officially approved by the manufacturers. Especially, gasohol is recommended for the cars with direct injection system or those cars that manufactured after 1995 because there will be no need for engine tune up (*Gasohol fact*. 2007: Online).

5.2 Benefits of gasohol

Ethanol can be produced domestically using crops such as sugarcane or cassava. Ethanol or ethyl-alcohol can be used in the production of many products such as alcoholic drinks, cosmetic, and medical solution Ethanol can also be used as alternative fuel by mixing gasoline with 10 percent ethanol. In 2000, PTT operated a trial by fueling car with gasohol, and the results showed that gasohol helped reduce pollution, help save energy, and caused no effect to the car performance. Furthermore, the testing procedures conducted by PTT Research and Technology Institute which is the most advanced in Southeast Asia showed that within 100,000 kilometers. There is no negative effect toward the engine capacity nor the driving. It is also proved to have better combustion and acceleration when compared to gasoline (*"High Quality Standard Gasohol" Helps save money and make car engine safe*. 2007: Online). Using gasohol will help the country save money from the decrease in imported MTBE and oil. In addition, using gasohol can reduce pollution from the use of ethanol instead of MTBE and solve the oversupply of agricultural

such as sugarcane and cassava, which can be sold at higher prices (*Gasohol benefit*. 2007: Online).

6. Previous related research

There are several researches conducted to explore different aspects relevant to consumer behavior, and consumer attitude toward alternative fuel product. For instance, in 2002, a research entitled “Consumer Satisfaction towards Biodiesel Usage in Bangkok Metropolis” was explored by Witraporn Werasai. The study objectives were to find out the consumer satisfaction towards the use of biodiesel, one of the alternatives fuel. The result showed that biodiesel quality should be improved to a standard. Moreover, government should advertise through various media, and reduce oil tax.

According to Sant Mee-krua’s study entitled “Factors influencing on car drivers’ cognition, Attitude, and Behavior towards gasoline octance 95 and octance 91 in Bangkok Metropolitan Area” in 2002. This research aimed to study car drivers’ cognition, attitude, and consumption behavior towards gasoline octance 95 and octane 91 as well as to analyze the relationships between the cognition, the attitude, and the consumption behavior of the car drivers. The results of this study showed that the car drivers who had higher education or higher income likely to have well cognition on gasoline and octance number than those who had lower education or lower income. The younger drivers had positive attitude toward gasoline octance 95 more than the older drivers did. The owner of the newer and bigger engine size of car had higher positive attitude toward gasoline octane 95 than the owners of the older and smaller engine size of car did.

In 2004, a research entitled “Customer Satisfaction towards gasohol 95 in Bangkok Metropolitan” was studied by Teeraphan Khongchan. The research aimed to study the level of customer satisfaction of the respondents focusing on marketing mix: product, price, place, and promotion. The result showed that the property of gasohol was different from other product in the market and gasohol is a new product so consumers lack of confidence in using. Moreover, there is not enough available gas station.

Another research entitled “The Consumers Attitude towards Biodiesel in Chiang Mai Province” was conducted by Teerachai Wasanasomsakul in 2004. The study reviewed that the most influential effect on biodiesel users’ consumption was the marketing factors. The findings showed that consumers were very satisfied with biodiesel because it did not cause annoying smell nor smoke. In addition, the study revealed the problem of the stroking of the car machine after using Biodiesel. The respondents stated that the price was not much different from regular diesel. In terms of attitude towards biodiesel, the study found that the respondents thought that the quality of regular diesel was better than biodiesel.

Convincingly, studies on consumer satisfaction towards fuel products such as biodiesel or various kinds of gasoline were investigated, but no research has been undertaken on factors affecting consumer decision on declining to use gasohol. This research revealed a different aspect worthy of investigation.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter presents the methodology of the research. It contains three sections: subjects of the study, instruments, and procedures.

1. Subjects of the study

The target subjects of this study were fifty automobile drivers who were randomly selected. These drivers fueled their car with benzene octane 91 or 95 at petrol stations in Bangkok area. The petrol stations in this study offered both benzene and gasohol to their customers. The researcher did not limit gender, ages, careers, educational background and income of the respondents.

2. Instruments

A questionnaire specially designed according to the objectives of the study was employed as an instrument for this study. The factors affecting drivers' decision on declining to use gasohol were focused.

In order to design a strong questionnaire that effectively answered the research questions, the researcher did a pilot survey by interviewing five drivers who fueled their cars with gasoline and five drivers who fueled their car with gasohol. The first draft of the

questionnaire was designed on the basis of information gathered from the pilot survey in accordance with the objectives.

To standardize the questionnaire, the researcher distributed the first version of the questionnaire to ten drivers who fueled their cars with gasoline to examine whether the drivers understood all the questions. The feedbacks from this first draft of the questionnaire were used to improve a better version of the final questionnaire. The final draft used in the study consisted of three parts; each part was designed with a specific purpose as follows:

Part I: General information of the respondents

This part was designed to gather the general data of the respondents including the year of their car, and the type of fuel they were using.

Part II: Respondents' opinion and understanding concerning gasohol

This part was designed to explore information regarding the respondents' opinions and understanding concerning gasohol.

Part III: Factors affecting drivers' decision on declining to use gasohol

This part was designed to investigate the factors most influencing drivers on declining to use gasohol and whether they would use gasohol in the future.

3. Procedures

3.1 Data collection

In order to study the factors affecting drivers' decision on declining to use gasohol, the researcher randomly distributed questionnaires to fifty automobile drivers who fueled their car with benzene at petrol stations in Bangkok in July 2007. The selected

petrol stations were ones where drivers could choose to fuel their car with either benzene or gasohol.

3.2 Data Analysis

After data collection was completed, the researcher classified the information into groups. Percentage was used for calculating and analyzing the data. Additionally, tables were used to illustrate the scores and rating of the respondents' answer. The findings were discussed and summarized to answer the research questions.

CHAPTER 4

FINDINGS

This chapter describes the data obtained from the questionnaires. Tables are drawn to display the findings in percentage and a brief discussion was presented below each table. The findings are divided into three main parts:

1. General information of the respondents
2. Respondents' opinion and understanding concerning gasohol
3. Factors affecting drivers' decision on declining to use gasohol

1. General Information of the Respondents

Fifty respondents were randomly selected to fill out the questionnaires in July 2007.

In this part, the general information of the respondents is presented as shown in tables 2 and 3.

Table 2 Year of the Car

Year of the Car	No.	Percentage
Before 1995	10	20
1995 – 1998	9	18
1999 – 2002	16	32
2003 – 2006	14	28
After 2006	1	2
Total	50	100%

The findings showed that 80% were manufactured after 1995 whereas 20% of the respondents' cars were made before then.

According to PTT Public Company Limited, they indicated that gasohol was recommended for cars manufactured after 1995 of which most were with the direct injection system. The findings showed that 80% of the respondents, whose cars could be filled with gasohol, still declined to use gasohol.

Table 3 Type of Fuel

Type of Fuel	Number	Percentage
Benzene 91	26	52
Benzene 95	24	48
Total	50	100%

Table 3 shows that 52% of the respondents fueled their car with benzene 91 and the rest of them (48%) fueled their car with benzene 95.

Since gasohol 91 was not available while this study was conducted, it could plausibly be assumed that those who fueled their car with benzene 91 did not have alternative fuel to use.

2. Respondents' Opinion and Understanding Concerning Gasohol

This part presents the respondents' opinion and understanding concerning gasohol including sources providing gasohol information, perception of gasohol quality, price, distribution, and promotion. The results of this part are demonstrated in Tables 4 to 12.

Table 4 Perception of Gasohol

	No. of the respondents	
	Yes	No
Have you ever heard about gasohol?	50	0
	(100%)	(0%)

Table 4 shows the responses of the respondents when they were asked if they heard about gasohol. All respondents stated that they heard about gasohol; therefore, gasohol was not new to them.

Tables 5 to 7 show the respondents' responses when they were asked to indicate which sources (media, person, and organization) provided them with the gasohol information.

Table 5 Media as Sources of Information

Type of Media	No. of the respondents	Percentage
Television	46	92%
Radio	14	28%
Newspaper	23	46%
Website	6	12%

Notes: 1) The respondents could choose more than one type of media.

2) No. of the respondents (50) and percentage (100%) were calculated based on each type of medias.

Regarding the type of media providing gasohol information to the respondents, the majority of the respondents (92%) stated that they received gasohol information via television whereas 46% of them received gasohol information from newspapers.

It could be plausibly assumed that television and newspaper were two influential medias that consumers tended to highly rely on.

Table 6 People as Sources of Information

Group of People	No. of the respondents	Percentage
Family member	15	30%
Relative	8	16%
Friend/colleague	35	70%
Mechanic	12	24%

Notes: 1) The respondents could choose more than one group of people.

2) No. of the respondents (50) and percentage (100%) were calculated based on each group of people.

In terms of people as sources of information, most of the respondents (70%) received gasohol information from friends or colleagues, whereas 30% of them received gasohol information from family member.

It could plausibly be that people tended to rely on the information obtained from friends or colleagues.

Table 7 Organization as Sources of Information

Organization	No. of the respondents	Percentage
Department of Land Transport	2	4%
Department of Energy	20	40%
Car manufacture	10	20%
Petrol station	23	46%

Notes: 1) The respondents could choose more than one organization.

2) No. of the respondents (50) and percentage (100%) were calculated based on each organization.

Regarding the organizations that provide gasohol information, the findings showed that 46% of the respondents received the gasohol information from petrol stations and 40% of them stated that they received the information from the Department of Energy.

It could plausibly be assumed from the findings that petrol stations and the Department of Energy were two reliable sources for the consumers.

To sum up, tables 5 to 7 showed the sources providing gasohol information the respondents relied on. Regarding medias, television and newspapers were two influential sources that consumers tended to rely on. In terms of people as sources of information, people tended to rely on the information obtained from friends or colleagues. In terms of organizations, drivers tended to rely on petrol stations and the Department of Energy.

Table 8 Perception of Respondents on Gasohol

Aspect concerning gasohol	No. of the respondents	Percentage
Gasohol quality	23	46%
Gasohol price	45	90%
Gasohol formula	22	44%

Notes: 1) The respondents could choose more than one aspect concerning gasohol.

2) No. of the respondents (50) and percentage (100%) were calculated based on each aspect concerning gasohol.

Table 8 shows that when the respondents were asked what information concerning gasohol they received, the majority of them (90%) knew how much gasohol price was, 46% of the respondents knew of gasohol quality, and 44% of the respondents knew of gasohol formula.

Obviously, in the era of fuel crisis, it could be said from the findings that drivers always kept their eye on the constantly rising price of fuel; they generally updated the current fuel prices offered by the petroleum providers. Therefore, they consequently knew the price of the product they were using as well as comparing to the ones alike.

TABLE 9 Perception Concerning Gasohol Property

Gasohol property	Respondent's opinion					
	Yes		No		Have no idea	
	No.	%	No.	%	No.	%
Gasohol reduces the acceleration rate of the engine.	18	36	15	30	17	34
Gasohol can damage the engine system.	9	18	21	42	20	40
Car using gasohol will run out of fuel faster than using benzene.	19	38	18	36	13	26
Alcohol burns more completely, thus increasing combusting efficiency and it provides a better environment by reducing carbon monoxide.	18	36	3	6	29	58
Alcohol may corrode certain materials used in engine(rubber and plastic etc.).	18	36	9	18	23	46
Gasohol is environment friendly.	30	60	5	10	15	30

Table 9 presents the respondents' perception of gasohol property. When the respondents were asked whether gasohol reduced the acceleration rate of car engine, 36% of them believed that this was true, 30% of the respondents disagreed with this statement.

Regarding the statement saying that "gasohol can damage the engine system", 42% of the respondents disagreed with the statement whereas 18% of them accepted that gasohol could damage the engine system.

When the respondents were asked if cars using gasohol would run out of fuel faster than using benzene, 38% of the respondents believed that this statement was true and 36% of them disagreed with this idea.

Meanwhile, referring to the statement indicating that “alcohol burns more completely, thus increasing combusting efficiency and it provides better environment by reducing carbon monoxide”, 58% of the respondents said that they had no idea on this issue whereas 6% of them disagreed with the statement.

When the respondents were asked if alcohol might corrode certain material used in engine (rubber and plastic, etc.), 46% of them had no idea concerning this statement whereas 36% of them believed that this idea might be true.

Concerning the issue of environment friendliness, 60% of the respondents responded that gasohol was environment-friendly whereas 30% of them had no idea about this.

To sum up, according to the statements based on the perception concerning gasohol, the findings indicated that most of the respondents had no idea concerning gasohol property. It could plausible be assumed that the respondents did not receive much information of gasohol property.

TABLE 10 Respondents' Perception Concerning Gasohol's Price

	Respondents' opinion					
	Yes		No		Have no idea	
	No.	%	No.	%	No.	%
Gasohol price is attractive to the consumers.	42	84	7	14	1	2

Table 10 shows the respondents' opinion concerning the gasohol price, 84% of the respondents stated that the gasohol price was attractive to the consumers. This is due to the fact that the gasohol price was lower than the benzene price. It was 3.50 baht cheaper than benzene when this study was carried out. In general, average consumers were likely to be attracted by products offered at a reasonable price when compared with the quality. Yet, gasohol was an interesting case despite its cheaper price. It might be possible that the respondents of this study relied on some other factors rather than on the gasohol price itself.

TABLE 11 Perception Concerning the Promotion of Gasohol

Perception on gasohol promotion	Respondents' opinion					
	Yes		No		Have no idea	
	No.	%	No.	%	No.	%
Information of gasohol is sufficient and clear.	21	42	24	48	5	10
There is enough research concerning the quality of gasohol.	16	32	18	36	16	32
Government continually launches gasohol campaign.	29	58	15	30	6	12

Table 11 describes the respondents' perception concerning the promotion of gasohol. When the respondents were asked if gasohol information is sufficient and clear, 48% of them stated that gasohol information is not sufficient or unclear to them; on the contrary, 42% of them mentioned that gasohol information is sufficient and clear.

When the respondents were asked whether there was enough research concerning gasohol, 36% of the respondents stated that there was not enough research concerning gasohol quality.

The findings also revealed that 58% of the respondents noted that the government continually launched gasohol campaigns while 30% of them did not believe so.

From the findings, we could possibly infer that although the respondents accepted that the government continually carried out gasohol campaigns, neither gasohol information

nor research concerning gasohol quality was sufficient to assure the consumers on the good quality gasohol.

TABLE 12 Perception Concerning Gasohol Distribution

Aspect concerning the petrol station	Respondent's opinion					
	Yes		No		Have no idea	
	No.	%	No.	%	No.	%
There are enough gasohol stations available.	21	42	19	38	10	20
There are enough gasohol service booths at the petrol station.	17	34	21	42	12	24

Table 12 presents the respondents' perception concerning gasohol distribution or petrol stations. When the respondents were asked if there was enough gasohol station available, 42% of the respondents stated that there were enough gasohol stations. However, when asked whether there were enough gasohol service booths provided at the petrol station, 42% of the respondents stated that there were not enough gasohol service booths at the petrol station.

Convincingly, from the researcher's observation during the time of the study, most of the petrol stations in Bangkok provided more numbers of benzene service booths than gasohol ones. This may be due to the fact that there were quite larger numbers of benzene consumers than those of gasohol.

3. Factors Affecting Drivers' Decision on Declining to Use Gasohol

This section presents factors affecting the decision process and the respondents' decision on using or declining to use gasohol including the reason of their decision. The results of this part are demonstrated in Tables 13 to 16.

TABLE 13 Factors Affecting Drivers' Decision on Declining to Use Gasohol.

Factors affecting driver decision	Influential level							
	High		Moderate		Little		No effect	
	No.	%	No.	%	No.	%	No.	%
Gasohol price	18	36	12	24	7	14	13	26
Acceleration rate	12	24	18	36	5	12	14	28
Formula (gasohol consisted of benzene and pure ethyl alcohol)	5	10	19	38	12	24	14	28
The risk in using a new product	12	24	19	38	12	24	7	14
Benefit of gasohol (reduce carbon monoxide emission from the engine)	9	18	17	34	10	20	14	28
Advertising about gasohol from various media	10	20	15	30	9	18	16	32
Gasohol campaign launched by the government	10	20	16	32	12	24	12	24
The number of petrol station in Bangkok and the countryside	10	20	21	42	10	20	9	18
Gasohol quality guaranteed by World Leader Automobile Companies	17	34	14	28	7	14	12	24
Recommend by those who are using gasohol	10	20	13	26	10	20	17	34
The expense in tuning up in car engine when it does not work with gasohol	21	42	13	26	5	10	11	22

When the respondents were asked to indicate the level of influential factors regarding the decision on declining to use gasohol, the study found three significant factors that highly influenced the respondents' decision on declining to use gasohol: the expenses in tuning up car engines when it did not work with gasohol, gasohol price, and gasohol guaranteed by the world's leading automobile companies.

The findings showed that 42% of the respondents pointed out that the expenses in tuning up car engine when it did not work with gasohol highly affected their decision on declining to use gasohol. This may be due to the rumor on the improper function of car engine using gasohol had been spread around when gasohol was newly launched. Therefore, the respondents might be suspicious of the need to pay extra expense in tuning their car engine and this resulted in the reluctance in using the new alternative fuel, gasohol.

Next, 36% of the respondents claimed that gasohol price was one of the significant factors affected their decision on consuming this fuel. This can be inferred that although the gasohol price is quite lower than benzene price, it is not low enough to attract some consumers to try this new kind of fuel.

Gasohol quality guaranteed by the World Leader Automobile Company is another factor that highly influenced the respondents' decision making. The results indicated that although gasohol is guaranteed by World Leader Automobile Company, 34% of the respondents insisted on declining to use this fuel. This may be inferred that despite the guarantee of certain authorities, consumers may rely more on their own belief in accordance with the risk of trying new product.

Also, the recommendation by those who were using gasohol did not seem to affect their decision on consuming this alternative fuel since 34% of the respondents claimed that recommendation on gasohol did not influence their decision at all.

To sum up, if consumers are suspicious of the quality of any new products that might be later harmful to their property, they are likely to decline to use that product in spite of its inexpensive price.

TABLE 14 Respondents' Decision on Consuming or Declining to Use Gasohol in the Future

	Absolutely not	May be/Probably
Will the respondents use gasohol in the future?	13 (26%)	37 (74%)

Table 14 shows the respondents' decision to use gasohol, 74% of the respondents indicated that they probably use gasohol in the future whereas 26% of them insisted that they would not use gasohol in the future. The reasons on whether the respondents would use gasohol or not are shown in Tables 15 and 16.

TABLE 15 Reasons indicating the Respondents will probably Use Gasohol in the**Future**

Reasons	Respondents	
	No.	%
Gasohol price is 20% cheaper than benzene.	19	51.35
There is more reliable research about gasohol.	6	16.22
Relative/ friend who formerly use gasohol recommend this fuel.	2	5.41
Benzene is not available in the market.	7	18.92
Car mechanic recommend this fuel.	2	5.41
Other	1	2.70
Total	37	100

Table 15 shows the reasons 74% of the respondents indicated that they would probably use gasohol in the future. The majority of them (51.35%) stated that they would use gasohol if gasohol price was 20% cheaper than that of benzene. This may be due to the fact that at the time of the study gasohol price was 3.50 baht, which was about 10%, cheaper than benzene price. 18.92% of the respondents stated that they would use gasohol if benzene was not available in the market while 16.22% of them stated that if there was more reliable research result about gasohol, they would probably use gasohol in the future.

TABLE 16 Reasons indicating the Respondents Insist not to Use Gasohol in the Future

Reasons	Respondents	
	No.	%
Gasohol price is not much different from that of benzene.	5	38.46
The gasohol research results are not reliable.	3	23.08
Relative/ friend who formerly use gasohol does not recommend this fuel.	0	0
Benzene is available in the market.	3	23.08
Car mechanic does not recommend this fuel.	0	0
The car engine does not support the use of gasohol.	1	7.69
Others	1	7.69
Total	13	100

This table shows the reasons 26% of the respondents insisted that they would not use gasohol in the future. 38.46% of them claimed that gasohol price was not much different from benzene price. It may be assumed that gasohol price offered was not much attractive to some consumers, or benzene price was affordable for them. 23.08% of them stated that the research results were not reliable while another 23.08% insisted to use gasoline because it was available in the market.

In conclusion, the results of the study revealed several significant factors influencing consumers on declining to use gasohol. The discussion of the major findings is elaborated in Chapter 5.

CHAPTER 5

CONCLUSION AND DISCUSSION

This chapter is divided into three main sections: summary of the study, discussion of the major findings, limitations of the study and recommendations for further studies.

Summary of the study

This study investigated the factors that influence the drivers' decision on declining to use gasohol, respondents' opinion and understanding concerning gasohol, and their decision on using gasohol in the future. This study was conducted in July 2007. Fifty automobile drivers in Bangkok fueling their car with gasoline were randomly asked to response to the questionnaire, and the data were collected and analyzed to answer the research questions.

Discussion of the major findings

Research question 1: What factors affect drivers on declining to use gasohol?

The study emphasized on drivers' opinion and understanding concerning gasohol as well as factors affecting their decision on declining to use gasohol.

It was found that all of the respondents accepted that they heard about gasohol; therefore, gasohol was not new to them. Moreover, the findings showed that most of the respondents received gasohol information via television and newspaper. It can plausible be assumed that television and newspaper were two influential medias that consumers tend to highly rely on. Convincingly, referring to an article entitled, "Influence of Television", it stated that television has incredible power as of it is a great tool for learning, communication and for information. No other source of information, including radio and website come close to the power of television (*Influence of television*. 2007 :Online). Besides television, newspaper is noted as another powerful media offering current information to literate people. In short, people in general can conveniently receive information they are interested in via TV and newspaper. Consequently, to effectively promote gasohol, the authorities should seriously emphasize the accurate gasohol information through these two medias in order to encourage drivers to consider this new alternative fuel.

From the findings based on the study concerning sources providing gasohol information, people play a major role as a source of information. The findings showed that most of the respondents received gasohol information from friends or colleagues while some of them received gasohol information from family members. It can plausible be

assumed that people tended to rely on the information obtained from friends or colleagues and family members. This can be ascertained by Basic Model of Consumer Behavior explained by Kotler (1991:168). He stated that one of the factors influencing consumers' behavior is social factors, which are reference groups e.g. family, friends, neighbors and coworkers. The respondents of this study tended to rely on an endorsement from someone they trust and know. Hence, the power of word-of-mouth, (especially the recommendation given by friends and family) is one of credible sources. Besides being a powerful information source, word-of-mouth is also the least expensive (*Power of word-of-mouth*. 2007: Online).

Since the organization was one of the sources providing gasohol information, it played an important role in promoting the use of gasohol. The findings showed that most of the respondents received gasohol information from petrol stations and the Department of Energy. It can plausibly be assumed that these two organizations were reliable sources for the consumers. Therefore, the government should consider these two information sources to help supporting new product consumption.

This study also focused on marketing mixes concerning gasohol price, property, promotion, and distribution.

The findings revealed that almost all of the respondents accepted that they knew of gasohol price. In addition, they agreed that gasohol price was attractive to consumers. Interestingly, although gasohol price was 3.50 baht cheaper than benzene's during the time of the study, the respondents of this study tended to decline to use gasohol. It is possible to assume that gasohol price was not low enough to attract the consumers to try this fuel. It may also probably due to the risk in consuming new product since risk was perceived

because buyer has little or no experience of the performance of the product or the decision process associated with the product (Solomon.1999:280).

In terms of gasohol property, the findings showed that most of the respondents perceived that gasohol was environment-friendly. It can be probably assumed that the results partly reflect the consumers' awareness on environment as well as their commitment for the society.

In terms of gasohol promotion, we can infer that although the respondents accepted that government continually carried out gasohol campaign, neither gasohol information nor research concerning gasohol quality was sufficient to assure the consumers on using gasohol.

In terms of gasohol distribution, the findings showed that gasohol could be obtained from most of the petrol stations but the respondents observed that gasohol service booths available at each petrol station was not sufficient. For instance, a certain petrol station may have several benzene service booths but only one gasohol booth is available. It may imply that there are a larger number of benzene consumers than those of gasohol. This may be due to the fact that how much (quantity) of a product or service available in the market is desired by buyers. The quantity demanded is the amount of a certain product people are willing to buy at a certain price (*Economic basics – Demand and Supply*. 2007: Online). Therefore, the number of benzene service booths available reflects the demand of the consumers and this means there are more consumers of benzene than those of gasohol.

Besides the study of the respondents' opinion and understanding concerning gasohol, this study also revealed factors affecting automobile drivers' decision on declining

to use gasohol. It was found that three factors influencing the respondents' decision were 1) the expenses in tuning up car engine when it does not work with gasohol, 2) gasohol price, and 3) gasohol quality guaranteed by world leader automobile companies.

Regarding the expenses in tuning up car engine when it does not work with gasohol, most of the respondents stated that the expenses in tuning up car engine were highly affected their decision on declining to use gasohol. This may be due to the fact that the rumor on the improper function of car engine using gasohol had been spread around when gasohol was newly launched. Therefore, besides the risk of consuming new product, the respondents might be suspicious if they needed to pay extra expenses in tuning up their car engine to support the alternative fuel while the common product was still affordable. Moreover, generally, today economy crisis has been impacting average people and they seem to be more watchful on their life expense. As mentioned by Lusch & Lusch (1949:124), if consumers believe that economy is unhealthy as a result of the economical situation remains highly unstable, then they tend to save for an uncertain future. Thus, if the consumers are likely to pay extra expenses when consuming new product, they obviously will be reluctant to use that product.

Second influential factor that affected the respondents' decision is gasohol price. During the time this study was conducted, although gasohol price was 3.50 baht cheaper than benzene's, some of the respondents were still declining to use gasohol. This can be inferred that although the gasohol price was quite lower than that of benzene, it is not low enough to attract some consumers to try this new alternative fuel. This is ascertained by Schiffman and Kanuk (1991) state that marketing inputs: product itself, pricing policy, promotion, and distribution channels are a direct attempt to reach, inform, and persuade

consumers to buy and use product. The findings show that price, one of the marketing input, counts as one important factor affecting the drivers' decision.

Even gasohol was guaranteed by World Leader Automobile Companies, some of the respondents insisted not to consume it. This can be inferred that despite the guarantee of certain authorities, consumers may rely more on their own belief in accordance with the risk of trying new product. Engel; Kollat; & Blackwell (1968) indicated that risks may be financial, physical, social, or combination of three. As Kotler and Armstrong (1999) pointed out that the characteristics of the new product affected its rate of adoption. It may possibly be assumed that gasohol has to take a long time to gain the acceptance from the drivers in consuming this new fuel.

Based on the findings, it can be concluded that three influential factors affecting drivers' decision on declining to use gasohol, the new product, are the expenses in tuning up car engine when it does not work with gasohol, gasohol price, and gasohol quality guaranteed by World Leader Automobile Companies.

Research question 2: Will these drivers decide to use gasohol in the future? Why/ Why not?

According to the second question, the respondents were put into two groups. The first group was the drivers who stated that they probably consume gasohol in the future, and the second group was the drivers who insisted not to consume gasohol.

The group of the respondents who probably used gasohol in the future indicated three reasons as follows: 1) gasohol price was 20% cheaper than benzene price, 2) benzene was not available in the market, and 3) there was more reliable gasohol research.

Since at the time of the study gasohol price was 3.50 baht lower, or about 10%, than that of benzene, the results indicated that gasohol price was not cheap enough to attract the respondents. This may be assumed that the consumers might believe that gasohol price could be lower than what it was.

In addition, some of respondents stated that they would probably use gasohol if benzene was not available in the market. That means they will not try new alternative products as long as the common product is still available on the market.

Moreover, reliable research on gasohol seems to affect the consumers' decision making. This may be due to the fact that new product may cause the uncertainty in its quality, and some research available during the launch of this new product is not sufficient to encourage the consumers to use it.

In short, the consumers perceived some risk in using new product and they needed more reliable research results to assure that using gasohol was not harmful to their cars' engine.

Another group of the respondents stated that they would not use gasohol in the future since most of them believed that gasohol price was not much different from benzene price. In addition, some of them were still declining to use gasohol as long as benzene was available in the market, and some did not rely on gasohol research results.

To sum up, the findings showed that there are three major reasons relating to the drivers' decision on consuming gasohol in the future. First, gasohol price seems to affect

the drivers' decision, and it was found that gasohol price was not attractive enough.

Second, as long as benzene is available in the market, the consumers tend to continue using the common product. This may be inferred that benzene is more reliable for the consumers. Third, the consumers need more reliable study on gasohol quality to assure them on the risk-free when consuming this new fuel.

To conclude, based on the findings, reasonable and attractive price of the new product and reliability of the product quality play very important roles in affecting consumers' decision making. Therefore, to employ an effective strategy to promote this alternative, gasohol, the authority should consider these two factors as the major and influential aspects.

Limitations of the study and recommendations for further studies

1. Since the number of the participants in the sample group was limited to only fifty automobile drivers in Bangkok area, it should be noted that the findings cannot be generalized to all automobile drivers in Thailand. Further study should concern a larger number of participants as well as different area in Thailand. The findings will represent the country wide data that will benefit directly to consumers, oil manufacturer, and our country.

2. This research aimed to study and examine factors influencing drivers' decision and their perception concerning gasohol through a closed questionnaire. Thus, it should be noted that the data analyzed to answer the research questions were based only on the respondents' response to the questionnaire. Hence, further research should employ open-ended questionnaire that can yield more in-depth analysis and results.

3. This study focuses on consumers fueling their car with gasoline regardless age, gender, and other social factors. Since the consumers personal factors regarding age, gender, education, income, etc might affect their consuming decision, further research should focus on these aspects.

4. Also, the results of this study represent the information at the time of the study only. The attitude and opinion of the consumers might change according to the time. Hence, continually research on the certain topic should be conducted to yield the most current results.

5. This study reveals the factors affecting automobile drivers' decision on declining to use gasohol and the results focus on some ineffective aspects concerning new product. Therefore, further study may explore the effective strategies affecting drivers on consuming gasohol, and the comparative results can be a useful guideline for the government.

6. This study focuses on factors affecting automobile drivers' decision on declining to use gasohol while at present, there are some other types of alternative fuel such as biodiesel, NGV, and LPG. Hence, further research should study on the factors affecting automobile drivers' decision on consuming/ declining to use different alternatives.

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APPENDIX
(QUESTIONNAIRE IN THAI)

แบบสอบถาม

หัวข้อเรื่อง: ปัจจัยที่ส่งผลกระทบต่อการตัดสินใจไม่ใช้แก๊สโซฮอลล์ของผู้ขับรถยนต์

แบบสอบถามฉบับนี้จัดทำเพื่อศึกษาถึงปัจจัยที่ส่งผลกระทบต่อการตัดสินใจไม่ใช้แก๊ส

โซฮอลล์ของผู้ขับรถยนต์ ผลการศึกษาที่ได้รับนอกจากใช้เป็นส่วนหนึ่งของการศึกษาแล้ว ยังจะ

ใช้เป็นแนวทางในการแก้ไขปรับปรุงการดำเนินงานของธุรกิจการผลิตและจัดจำหน่ายแก๊ส

โซฮอลล์ให้ดียิ่งขึ้นในอนาคต ซึ่งจะส่งผลดีต่อผู้บริโภคโดยตรง

แบบสอบถามประกอบด้วย 3 ส่วน:

ส่วนที่ 1: ข้อมูลทั่วไปของผู้ตอบแบบสอบถาม

ส่วนที่ 2: ข้อมูลความรู้ความเข้าใจเกี่ยวกับแก๊สโซฮอลล์ของผู้ตอบแบบสอบถาม

ส่วนที่ 3: ปัจจัยที่ส่งผลกระทบต่อการตัดสินใจไม่ใช้แก๊สโซฮอลล์ของผู้ตอบแบบสอบถาม

ส่วนที่1: ข้อมูลทั่วไปของผู้ตอบแบบสอบถาม

คำชี้แจง : โปรดทำเครื่องหมาย **X** หน้าข้อที่ต้องการ หรือกรอกข้อความลงในช่องว่าง

1. รถของท่านจัดอยู่ในปี ค.ศ. _____

2. รถของท่านเติมน้ำมันประเภทใด

น้ำมันเบนซิน 91

น้ำมันเบนซิน 95

ส่วนที่2: ข้อมูลความรู้และความเข้าใจเกี่ยวกับแก๊สโซฮอลล์ของผู้ตอบแบบสอบถาม

คำชี้แจง : โปรดทำเครื่องหมาย **X** หน้าข้อที่ต้องการหรือกรอกข้อความลงในช่องว่าง

1. ท่านเคยได้รับข้อมูลข่าวสารเกี่ยวกับน้ำมันแก๊สโซฮอลล์หรือไม่

เคย

ไม่เคย

2. ท่านได้รับทราบข้อมูลเกี่ยวกับแก๊สโซฮอลล์ทางใด (ตอบได้มากกว่า 1 ข้อ)

2.1 สื่อต่าง ๆ

โทรทัศน์

หนังสือพิมพ์

วิทยุ

เว็บไซต์

อื่น ๆ โปรดระบุ.....

2.2 บุคคล

สมาชิกในครอบครัว

เพื่อน / เพื่อนร่วมงาน

ญาติ

ช่างรถยนต์

อื่น ๆ โปรดระบุ.....

2.3 หน่วยงาน

- กรมขนส่งทางบก กระทรวงพลังงาน
 ผู้ผลิตรถยนต์ สถานีบริการน้ำมัน
 อื่น ๆ โปรดระบุ.....

3 ข้อมูลที่ท่านได้รับเกี่ยวกับแก๊สโซฮอล์ (ตอบได้มากกว่า 1 ข้อ)

- คุณภาพของน้ำมันแก๊สโซฮอล์
 ราคาแก๊สโซฮอล์ที่ถูกกว่าน้ำมันเบนซิน
 ส่วนผสมของแก๊สโซฮอล์
 เป็นมิตรกับสิ่งแวดล้อม

4 ข้อมูลที่ทราบเกี่ยวกับคุณสมบัติของแก๊สโซฮอล์

ข้อมูล	ใช่	ไม่ใช่	ไม่ทราบ
แก๊สโซฮอล์ทำให้เครื่องยนต์มีกำลังแรงลดลง			
แก๊สโซฮอล์ทำให้เครื่องยนต์สึกหรอมากขึ้น			
แก๊สโซฮอล์ทำให้เครื่องยนต์กินน้ำมันมากขึ้น			
แอลกอฮอล์เผาไหม้หมดจด ช่วยลดควันดำ			
ส่วนผสมของแก๊สโซฮอล์มีผลเสียกับส่วนที่เป็นยางและพลาสติกของเครื่องยนต์			
แก๊สโซฮอล์เป็นมิตรกับสิ่งแวดล้อม			

5. ความคิดเห็นของท่านเกี่ยวกับราคาของแก๊สโซฮอล์

	ใช่	ไม่ใช่	ไม่ทราบ
ราคาแก๊สโซฮอล์สามารถดึงดูดความสนใจของผู้บริโภคได้			

6. ความคิดเห็นเกี่ยวกับการส่งเสริมการตลาด ของแก๊สโซฮอลล์

	ใช่	ไม่ใช่	ไม่ทราบ
การให้ข้อมูลเกี่ยวกับแก๊สโซฮอลล์เพียงพอ/ ชัดเจน			
งานวิจัยที่รับประกันคุณภาพแก๊สโซฮอลล์น่าเชื่อถือ			
การรณรงค์เรื่องแก๊สโซฮอลล์ของรัฐบาลอย่างต่อเนื่อง			

7. ข้อมูลที่ท่านทราบเกี่ยวกับสถานที่จัดจำหน่ายแก๊สโซฮอลล์

	ใช่	ไม่ใช่	ไม่ทราบ
มีสถานีบริการแก๊สโซฮอลล์ครอบคลุมทั่วประเทศ			
มีจำนวนช่องให้บริการแก๊สโซฮอลล์ภายในสถานีบริการเพียงพอต่อความต้องการ			

ส่วนที่ 3: ปัจจัยที่ส่งผลต่อการตัดสินใจไม่ใช้แก๊สโซฮอลล์ของผู้ตอบแบบสอบถาม

คำชี้แจง : โปรดทำเครื่องหมาย X บนตัวเลขที่ตรงกับระดับของปัจจัยที่ส่งผลต่อการ

ตัดสินใจไม่ใช้แก๊สโซฮอลล์ของท่าน

ระดับผลกระทบของแต่ละปัจจัย

ที่มีผลต่อการตัดสินใจ	มาก	ปานกลาง	น้อย	ไม่มีผล
1. ราคาแก๊สโซฮอลล์	3	2	1	0
2. อัตราเร่งของเครื่องยนต์	3	2	1	0
3. ส่วนผสมของแก๊สโซฮอลล์ (น้ำมันเบนซิน และ แอลกอฮอล์)	3	2	1	0
4. ความเสี่ยงในการใช้สินค้าใหม่	3	2	1	0
5. ข้อดีของแก๊สโซฮอลล์ซึ่งช่วยลดควันดำ	3	2	1	0
6. การโฆษณาประชาสัมพันธ์ข้อมูลเกี่ยวกับ แก๊สโซฮอลล์จากสื่อต่าง ๆ	3	2	1	0
7. การส่งเสริมและการรณรงค์ของรัฐบาลเกี่ยวกับ แก๊สโซฮอลล์	3	2	1	0
8. จำนวนสถานีบริการจัดจำหน่ายแก๊สโซฮอลล์ ในกรุงเทพและต่างจังหวัด	3	2	1	0

ระดับผลกระทบของแต่ละปัจจัย

ที่มีผลต่อการตัดสินใจ	มาก	ปานกลาง	น้อย	ไม่มีผล
9. การรับประกันในตัวคุณภาพของแก๊สโซฮอลล์ จากผู้ผลิตรถยนต์ชั้นนำ (เช่น โตโยต้า มอเตอร์ ไทยแลนด์, เจนเนอรัล มอเตอร์ ไทยแลนด์)	3	2	1	0
10. ผู้มีประสบการณ์การใช้แก๊สโซฮอลล์มาก่อน ไม่แนะนำให้ใช้	3	2	1	0
11. ค่าใช้จ่ายในการปรับแต่งเครื่องยนต์ในกรณี เครื่องยนต์ไม่รองรับการใช้แก๊สโซฮอลล์	3	2	1	0
12. ในอนาคตท่านคิดจะใช้แก๊สโซฮอลล์หรือไม่ (เลือกคำตอบเพียงข้อเดียว)				
<input type="checkbox"/> ไม่ใช่แน่นอน เพราะ..... (เลือกเหตุผลในข้อ 12.1)				
<input type="checkbox"/> อาจจะใช่ (ถ้า)..... (เลือกเหตุผลในข้อ 12.2)				

12.1 เหตุผลหลักที่มีผลต่อการตัดสินใจไม่ใช้แก๊สโซฮอล์ของท่านในอนาคต

- ราคาแก๊สโซฮอล์และน้ำมันเบนซินไม่แตกต่างกันมาก
- งานวิจัยคุณภาพแก๊สโซฮอล์ที่เผยแพร่ยังไม่เป็นที่เชื่อถือ
- ญาติ พี่น้อง หรือเพื่อน ลองใช้และไม่แนะนำให้ใช้
- น้ำมันเบนซินยังมีจำหน่าย
- ช่างยนต์ที่ศูนย์บริการไม่แนะนำให้ใช้
- สภาพเครื่องยนต์ไม่รองรับ
- อื่น ๆ (โปรดระบุ).....

12.2 เหตุผลแรกที่มีอิทธิพลต่อการตัดสินใจใช้แก๊สโซฮอล์ของท่านในอนาคต

- ราคาแก๊สโซฮอล์ถูกกว่าประมาณ 20 % ของราคาน้ำมันเบนซิน
 - มีการเผยแพร่ข้อมูลเกี่ยวกับงานวิจัยคุณภาพแก๊สโซฮอล์มากกว่าปัจจุบัน
 - ญาติ พี่น้อง หรือเพื่อน เคยลองใช้และแนะนำให้ใช้
 - รัฐบาลยกเลิกการจำหน่ายน้ำมันเบนซิน
 - ช่างยนต์ที่ศูนย์บริการแนะนำให้ใช้
 - อื่น ๆ (โปรดระบุ).....
- ■

APPENDIX
(QUESTIONNAIRE IN ENGLISH)

Questionnaire

This questionnaire is designed to explore the factors affecting automobile drivers' decision on declining to use gasohol. Your answer will greatly provide vital information for conducting this study. Your participation will be treated with absolute confidentiality and information you provide will be used for the study purpose only. Please feel free to provide as much information as you can.

The questionnaire is divided into 3 parts as follows:

Part I : General information of the respondents

Part II : Respondents' opinion and understanding concerning gasohol

Part III : Factors affecting drivers' decision on declining to use gasohol.

Part I General information of the respondents

Instructions: Please fill in this questionnaire by marking (X) the appropriate items or writing your answer in the space provided.

1. Year of the car

2. What type of fuel do you use?

Benzene 91

Benzene 95

Part II : Respondents' opinion and understanding concerning gasohol

Instructions: Please fill in this questionnaire by marking (X) the appropriate items or writing your answer in the space provided.

3. Have you ever heard about gasohol?

Yes

No

4. Which source(s) provide(s) you the information of gasohol? (Check all applicable)

4.1 Media (s)

Television

Newspaper

Radio

Website

Others (please specify).....

4.2 People

Family member

Friend / colleague

Relative

Mechanic

Others (please specify)

4.3 Organization

- Department of Land Transport Department of Energy
 Car manufacturer Petrol station
 Others (please specify)

5. What do you know about gasohol? (Check all applicable)

- Gasohol quality
 Gasohol price
 Formular
 Other (please specify)

6. What is your perception concerning gasohol property?

	Yes	No	Have no idea
Gasohol reduces the acceleration rate of the engine.			
Gasohol can damage the engine system.			
Car using gasohol will run out of fuel faster than using gasoline.			
Alcohol burns more completely, thus increasing combustion efficiency and it provides a better environment by reducing carbon monoxide.			
Alcohol may corrode certain materials used in engine (rubber and plastic, etc.).			
Gasohol is environment-friendly			

7. What is your perception concerning gasohol price?

	Yes	No	Have no idea
Gasohol price is attractive to the consumers.			

6. What is your perception concerning the promotion of gasohol?

	Yes	No	Have no idea
Information of gashol is sufficiency and clear.			
There is enough research concerning the quality of gasohol.			
Government does continually launch gasohol campaign.			

7. What is your perception concerning the petrol station?

	Yes	No	Have no idea
There is enough gasohol station available.			
There are enough service booths at the petrol station.			

Part III : Factors affecting drivers' decision on declining to use gasohol.

Instructions: Please check (X) the appropriate level of factors that affect your decision on declining to use gasohol.

<u>Level of the Factor affecting your decision</u>	<u>High</u>	<u>Moderate</u>	<u>Little</u>	<u>No effect</u>
1. Gasohol price	3	2	1	0
2. Acceleration rate	3	2	1	0
3. Formular (gasohol consisted of benzene and pure ethyl alcohol)	3	2	1	0
4. The risk in using a new product	3	2	1	0
5. Benefits of gasohol (reduces carbon monoxide emission from the engine)	3	2	1	0
6. Advertising about gasohol from various media	3	2	1	0
7. Gasohol campaign launched by the Government	3	2	1	0
8. The number of petrol station in bangkok and the country	3	2	1	0
9. Gasohol quality guaranteed by World Leader Automobile Companies e.g. Thailand Toyota Motor, General Motor (Thailand)	3	2	1	0

Level of the Factor affecting your decision	High	Moderate	Little	No effect
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10. Not recommended by those who used gasohol formerly	3	2	1	0
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11. The expenses in tuning up car engine when it does not working with gasohol	3	2	1	0
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12. Are you going to use gasohol in the future? (Choose only one answer)

Absolutely not because ... (Choose the reason in the item no.12.1)

Maybe/ probably (if) ... (Choose the reason in the item no.12.2)

12.1 Give reason why you don't use gasohol.

(Choose one major reason that most affects your decision on insisting not to use gasohol)

Gasohol price is not much different from benzene price.

The research result is not reliable.

Relative/ friend who formerly use gasohol do not recommend this fuel.

Benzene is available in the marketing.

Car mechanic does not recommend this fuel.

The car engine does not support the use of gasohol.

Others (please specify).....

12.2 Give the reason why do you probably use gasohol in the future.

(Choose the first reason influences on using gasohol in the future)

- Gasohol price is 20% cheaper than benzene.
- There is more reliable research about gasohol.
- Relative/ friend who formerly use gasohol recommend this fuel.
- Benzene is not available in the market.
- Car mechanic recommend the use of gasohol.
- Others (please specify).....

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VITAE

VITAE

Name: Miss Arporn Pipattam
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