

# A Study of Van Drivers' Satisfaction with a NGV (Natural Gas Vehicle) Gas Service Station in Phra Samut Chedi District in Samut Prakan Province

Theerapa Wivatanasak<sup>1</sup>, Chaiyaphu Leepipatpaiboon<sup>2</sup>, Naphak Hongchamrat<sup>3</sup>

<sup>1-3</sup> *Industrial Management Faculty of Business Administration Bangkok Thonburi University*

**Abstract:** This research aims to study the satisfaction of the drivers of vans with NGV (Natural Gas Vehicle) service stations in Phra Samut Chedi District in Samut Prakan Province. Entrepreneurs can use the results of this research to create a marketing strategy to improve the quality of factors that affects the NGV users' satisfaction with the NGV gas service station. A structured survey questionnaire was used as a tool to collect data from a sample of 200 NGV van drivers at a service station in Phra Samut Chedi District in Samut Prakan province, it was discovered that most of the respondents: were male accounting for 97%; aged 31-40 years representing 36.5%; had lower than a bachelor's degree accounting for 96.5%; were singled accounting for 52.2%; had an average monthly income of 20,001 – 25,000 Baht accounting for 66.5%. The frequency of filling NGV gas per month is 18-25 times/month accounting for 53.5%. The cost of refueling NGV gas per month is 7,000 – 10,000 baht/month accounting for 76.5%. And the age of most vans is 3-6 years accounting for 56.5%. The sample of van drivers using NGV gas in the service station gave importance to the level of satisfaction with the decision to use NGV service station. The order of importance consists of physical aspect, product aspect, price aspect, personnel aspect as well as marketing promotion, service process and distribution.

**Keyword:** satisfaction, NGV gas, Van

---

## 1. Introduction

Energy is a fundamental factor in the country's economy especially in the business and industrial sectors, though Thailand currently has crude oil, natural gas, coal, and commercial energy. But it is not enough to meet the domestic demand. While the current fuel price has risen and continued to have a rising trend, Thailand must rely on energy from abroad by importing. In 2002, Thailand had to import 47 million tons of oil from foreign countries. This accounts for 55.20% of total energy demand which accounted for the value of the import of energy of over 300 billion Baht most of which are petroleum products in the transportation sector including diesel and gasoline.

For Thailand, there is also an energy problem because natural energy sources are not enough to produce. From the statistics of refined fuel imports to Thailand by the Office of the Ministry of Energy from 2012 to 2014, it was found that the amount of refined fuel imported has increased consumer demand every year. In 2012, an average of 67.2 thousand barrels of refined fuel imports were used per day, which is over an average of 75.5 thousand barrels of refined fuel imports per day more than 2012. And in 2014, the import volume of refined fuel was the highest, averaging 80.2 thousand barrels per day.

Due to the economic situation in regard to the rising fuel prices in Thailand, consumers are more interested in choosing NGV (Natural Gas Vehicle) to reduce the cost of using fuel as their main energy. According to the NGV

sales statistics of the Energy Policy and Planning Office of the Ministry of Energy in 2017, when comparing sales in 2017, it was found that the trend of selling NGV (Natural Gas Vehicle) in 2007 to 2017 has a higher usage growth rate. The year with the highest average sales of NGV (Natural Gas Vehicle) was in 2014 in which NGV (Natural Gas Vehicle) was sold at 105,683 tons per year. This was second after the year 2013 in which the sale of NGV (Natural Gas Vehicle) reached 102,484 tons per year. This means the years between 2013 and 2014 had the highest fuel price. The use of NGV (Natural Gas Vehicle) gas is therefore an alternative that can replace the use of fuel in the transportation sector for various types of vehicles. In addition, to maximize the use of existing energy, it also reduces dependence on foreign energy especially crude oil and refined oil which tends to increase steadily.

As the government encourages consumers to turn to NGV engines, the Ministry of Energy and Petroleum Company of Thailand Public Company Limited (Public) and research institutes collaborate to develop tanks and methods to improve various vehicle models to be able to support the operation of the NGV system. This has been publicized to the public by campaigning to raise awareness of energy saving and environmental conservation for car users to turn to NGV to help solve the country's economic problems in both the public and private sectors. Therefore, since NGV (Natural Gas Vehicle) gas is becoming more and more important especially for the transportation sector. There needs to be an intensive study of the satisfaction of van drivers who used the service at some NGV (Natural Gas Vehicle) service station. As for the location, Phra Samut Chedi District in Samut Prakan province was selected. The questions established were what the opinion was given about this, what the pros and cons were, and any suggestion to be given. The main reason why the service is important for van factor is obviously the tendency for motorist to turn to use more gas as a renewable energy. Related documents and researches revealed the factors that were important for the installation of gas in vehicles were mainly the theory of 4Ps and 7Ps. This research would be used as key information for making decision whether or not to use NGV (Natural Gas Vehicle) as renewable energy. In addition, the research findings would be important for those who were interested in opening an NGV gas service center. This research played an important part in helping making decision for new investments.

## **2. Research Objectives**

1. To study the demographic characteristics of van drivers who use NGV (Natural Gas Vehicle) in gas service stations in Phra Samut Chedi District in Samut Prakan province
2. To study the market mix that determines the use of service from NGV (Natural Gas Vehicle) stations in Phra Samut Chedi District in Samut Prakan province
3. To study the satisfaction of NGV van drivers with the service from gas service stations in Phra Samut Chedi District in Samut Prakan province

## **3. Research Method**

### **Research Model**

This study aimed to study the satisfaction of NGV (Natural Gas Vehicle) van drivers vans with service stations in Phra Samut Chedi District in Samut Prakan province using only quantitative research methods.

## **4. Population and Sample**

### **Population**

The population used in this research was a group of NGV (Natural Gas Vehicle) van drivers using NGV refueling services at a service station in Phra Samut Chedi District in Samut Prakan province.

### **Sample Group**

The sample group used in this study was a group of drivers of NGV (Natural Gas Vehicle) van at a service station in Phra Samut Chedi District in Samut Prakan province which derived from the largest population group. With no precise data on NGV van drivers, it was not possible to know the exact number of real users. Therefore, the sample group was determined using Cochran formula (Conhran, 1977) by setting the values at the level of 95% certainty and not more than 5% tolerance for depression. Based on the calculations, an

appropriate sample size of 192 persons was obtained. However, a sample of 200 was retained to prevent errors that may occur from the incomplete data collection.

## 5. Research Instrument

This study used a quantitative research method. A structured survey questionnaire was used as the research instrument which consists of three parts to achieve the objectives and cover all variables used in the study as follows:

Part 1 Demographic Information of the Respondents. This part contains gender, age, education level, marital status and average monthly income. The questionnaire used single answer format (Single Choice Questions) based on the Nominal Scale and Ordinary Scale.

Part 2 Behavior of Van Drivers who use the Service at NGV Gas Service Stations. It is a questionnaire with single and multiple-choice questions using the Nominal Sale and Ordinary Scale data standards.

Part 3 Level of Satisfaction with the Service at NGV Gas Service Stations in Phra Samut Chedi District in Samut Prakan province. It uses a rating scale, which divides satisfaction into 5 levels from least to greatest (Likert Scales).

## 6. Data Analysis

Data analysis of the research on satisfaction of van drivers using NGV (Natural Gas Vehicle) gas at service stations in Phra Samut Chedi District in Samut Prakan province can be divided into 2 parts as follows:

1. Descriptive statistical analysis. This part describes demographic characteristics including gender, age, educational level, marital status and average monthly income. These data were presented in the forms of frequency distribution tables, mean and proportional values, and standard deviation.
2. Inferential statistical analysis. This part tests the relationship between independent variables and dependent variables. By studying the data of the sample group, the statistical analytical software was used to test the hypothesis (Hypothesis Testing).

## 7. Research Results

### **The results of data analysis of demographic factors**

The results of data analysis of demographic characteristics of NGV (Natural Gas Vehicle) van drivers who used the service at service stations in Phra Samut Chedi District in Samut Prakan province found that most of the sample group were: 9.3% male, 36.5% aged 31-40 years, 96.5% had lower education level, 96.5% had single status, and 52.2% had average monthly income at 20,001 – 25,000 Baht per month.

### **The results of the analysis of behavioral data of van drivers using NGV gas in service stations**

The results of the analysis of data about the behavior of van drivers using NGV gas at the service station of the sample group found that most of the samples found that: most of the cost of filling up NGV per month was 7,000 – 10,000 Baht per month accounting for 76.5% per month; the frequency of filling NGV gas per month is 18-25 times per month accounting for 53.5%; and the used vans have a service life of about 3-6 years accounting for 56.5%.

### **Analysis of the Market Mix (7P's)**

The sample group gave importance to factors affecting satisfaction of van drivers using NGV gas in service stations as follows:

- As for marketing mix in terms of product, it was found that the level of importance is high. The NGV van driver who used the refueling service at the gas station agreed with the statement "I feel satisfied with the use of service at the station because the equipment in the car was related to the NGV system with the correct standards" with an average of 3.38. This is followed by the statement "NGV gas at the service station has the appropriate filling pressure for the vehicle" at high level, with an average of 3.30 and the statement "NGV gas filling does not affect or damage the car used" at high level with an average of 3.28.

- As for marketing mix in terms of price, it was found that the level of importance at high level was given by NGV van drivers at the service station to the statement "I feel satisfied with the use of service at the station because of the price of NGV gas goes in accordance with the standard introduced by the regulator" with an average of 3.31, followed by "NGV prices are lower than oil prices" at high level with an average of 3.29 and "The cost of maintaining the equipment of the NGV system inside the car is worth using" at high level with an average of 3.26.

- As for marketing mix factor in terms of distribution channels, it was found that the level of importance was at high level given by the driver of NGV van using gas service at the service station to the statement "I am satisfied with the use of service stations because each service station has similar quality" with an average of 3.16, followed by "The number of NGV gas filling nozzles is sufficient without having to wait for a long time" at high level with an average of 2.29 and "Most service stations are easy to find and convenient to use" at high level with an average of 2.26.

- As for marketing mix in terms of marketing promotion, it was found that the level of importance was at high level given by NGV van drivers were satisfied with the stations. They rated high on the statements "They use the service stations because each service station has an advertisement or publicity sign" with an average of 3.34; "The transportation of NGV gas from government agencies" at high level with an average of 3.32, and "The use of discount vouchers according to the discount card scheme of PTT or the government" at a high level with an average of 3.25.

- As for marketing mix in terms of personal selling, it was found that the level of importance is high. The NGV van drivers at the service station rated high on the statement "I felt that it was expensive", though I was satisfied with the service station due to the adequacy of service personnel at the service station" with an average of 3.37; "The staffs are willing to provide the service" at high level with an average of 3.30; "The staffs are trained about NGV and can fix basic problems" at high level with an average of 3.23.

- As for marketing mix in terms of physical appearance, it was found that the level of importance is high for NGV van driver who filled the gas at in the NGV service station. They rated high on the statement "Satisfaction with using a service station due to other facilities compared to gas stations such as minimarts and restrooms" with an average of 3.38. This is followed by "The cleanliness of the service station" at high level with an average of 3.30 and "The service station is very spacious" with an average of 3.28.

- As for marketing mix in terms of service processes, it was found that priority at a high level was given to the statement "I feel satisfied with the use of service at the service station because the NGV filling process is safe" with an average of 3.42. This is followed by "The length of time it takes to refuel NGV gas" at high level with an average of 3.24, and "The process of checking the NGV system standard in the car" is at high level with an average of 3.14.

In sum, the analysis of the importance of the marketing mix factor showed that NGV van drivers who used the service at the service station in Phra Samut Chedi District in Samut Prakan province were placed with great importance with a total mean of 3.158.

## 8. Conclusion and Discussion

The analysis of data in relation to marketing mix factors (7P's) including product, price, distribution channel, marketing promotion, personnel, physical appearance and the service process was carried out. It was discovered that there was a correlation with the satisfaction of NGV gas (Natural Gas Vehicle) van drivers with the use of service at service stations in Phra Samut Chedi District in Samut Prakan province.

- Product. The NGV van drivers had high level of overall satisfaction. The sub-factor that the respondents were satisfied with first was that the equipment in the car related to the NGV system that meets the correct standard. This is in line with the results of the study of Samrankong (2007) who found that the respondents showed opinions "Very Agree" about the use of NGV gas at high level.

- Price. The NGV van drivers had high level of overall satisfaction. The first sub-factor that the respondents were satisfied with was the price of NGV gas, which was lower than the oil price. This is consistent with the results of the study of Chaisuk (1999) and Wong (2003) who discovered that the respondents' feelings towards

renewable energy were selected at high level in which the price should be lower than the price of gasoline octane.

- Service Channel. The NGV van drivers were satisfied in overall at high level. The sub-factors that the respondents were satisfied with the fact that service stations in each area are of similar quality.
- Marketing Promotion. The NGV van drivers had high average level of overall satisfaction. The first priority of satisfaction is that each service station had billboards or clear publicity signs. This is consistent with the study of Chaisuk (1999) that marketing promotion affects the selection of gas stations.
- Personnel factor. The NGV van drivers had high level of overall satisfaction. The first satisfaction was the sufficiency of personnel who provide the service at the service station. This is consistent with the results of a study by Chaisuk (1999) that the respondents value the stations that show politeness and speed of service personnel.
- Physical Appearance. The NGV van drivers had high average of overall satisfaction, of which the sub-factors the respondents' satisfaction ranked first was other facilities.
- Process factors. The NGV van drivers had high level of overall satisfaction. The factor that the respondents were satisfied with as the first priority was that the first step of NGV refueling was safe, which is consistent with the results of the study by Sompraphat (2006).

## 9. Recommendation

### Research Suggestion

This study aimed to determine the satisfaction of NGV (Natural Gas Vehicle) van drivers who used the service at service stations in Phra Samut Chedi District in Samut Prakan province. It was found that marketing mix consisted of products, prices, distribution channels, marketing promotion, personnel aspect, physical appearance and the service process had a service relationship. This relationship affected the satisfaction of NGV van drivers using gas fueling service at the service stations. Recommendations from the research can be described as follows:

- Product side Operators should check the various quality and pressure at appropriate level as well as the standard at all times and close to all service stations.
- Price Operators and supervisory agencies should maintain a standard in order to determine the middle price that is fair to consumers.
- Distribution channel Entrepreneurs should have channels to manage the process to make it more convenient and faster for consumers.
- Marketing promotion Entrepreneurs and government agencies should do more public relations and provide encourage more use of NGV gas.
- Personnel Entrepreneurs should train personnel proper knowledge about products so that they can give advice to the customers more in relation to the safety of consumers.
- physical Operators should maintain more cleanliness and tidiness of the service station.
- Process Operators should introduce more steps to check the NGV system standards inside the car.

## 10. References

1. Ministry of Energy. (2007). Petrol price table. accessible from <http://www.energy.go.th>
2. Ministry of Energy. (2006). Crude Oil Import Report. accessible from <http://www.Dede.go.th>Jarupee Chinpongpaian. (2006) research report titled Satisfaction of motor vehicle users with fuel prices, a case study of private cars in Bangkok. Bangkok: Kasetsart University.
3. Chatchai Euamongkol and Duangkamol Amitpai. (2007). People's Attitudes and Satisfaction. in Udon Thani municipality towards LPG and NGV. (Research Report). Bangkok: Kasetsart University.
4. Songkrit Worapanya family (2004). Consumer Behavior and Factors Influencing Fuel Oil in Muak Lek District. Saraburi Province. (Master of Business Administration Thesis). Bangkok. Faculty of Business Administration Kasetsart University.
5. Pathompong Bamreob and Pornthip Kiatpakpoom. (2006). Attitudes of purchasing NGV gas of personal vehicle users, a case study in Bangkok. (Research Report). Bangkok: Professional Center Publishing.

6. Panithan Sompraphat. (2006). Attitudes of private car users in Bangkok to the use of gasohol. (Independent research, Master of Business Administration). Chiang Mai: Graduate School, Chiang Mai University.
7. Prapchok Pramkitkit. (1993). Gasoline Demand Analysis in Bangkok: A Case Study in Pathumwan District. Bangkok. (Master's Thesis in Economics). Bangkok: Faculty of Economics Chulalongkorn University.
8. Pongphan Chompupachara. (2006). Manual for NGV and LPG gas installation. (Independent research, Master of Business Administration). Chiang Mai: Chiang Mai University.
9. Pornpen Lertthatwong. (2003). Attitude towards renewable energy (ethanol) as automobile fuel of consumers in Samut Sakhon Province. (Master of Business Administration Thesis). Chiang Mai: Graduate School Chiang Mai University.
10. Praiwan Tannng. (2006). Subject: Behavior of Credit Card Service of Credit Card Holders of Bank of Ayudhya Public Company Limited in Muang District, Chonburi Province. (Master's thesis). Chonburi: Burapha University.
11. Phoomphao Sarankong. (2007). Attitudes of private car users in Chiang Mai Province towards LPG use. (Master of Business Service Thesis). Chiang Mai: Graduate School Chiang Mai University.

#### **INFO**

**Corresponding Author:** *Theerapa Wivatanasak (Industrial Management Faculty of Business Administration Bangkok Thonburi University)*

**How to cite this article:** *Theerapa Wivatanasak, Chaiyaphu Leepipatpaiboon, Naphak Hongchamrat, A Study of Van Drivers' Satisfaction with a NGV (Natural Gas Vehicle) Gas Service Station in Phra Samut Chedi District in Samut Prakan Province, Asian. Jour. Social. Scie. Mgmt. Tech.2022; 4(2): 200-205.*