THE STUDY OF THE ATTITUDE OF DRIVERS TOWARDS THE USE OF NGV INSTEAD OF DIESEL FUEL: A CASE STUDY OF TRANSPORTATION COMPANY.

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ABSTRACT

The purpose of this research was; 1. Study the attitude of the transportation company's truck drivers to change to use NGV (Natural Gas for Vehicle) instead of Diesel fuel, 2. Study information and guidelines for the decision to improve engines to be able to use NGV instead of Diesel fuel for the company's transportation's trucks. Populations of this research are 100 transportation company's truck drivers. The research instrument is a questionnaire. Standard deviation Independent T-test, One-way analysis of variance (One-way ANOVA) and double difference analysis using Scheffe method. Use SPSS program for statistical analysis. This research determines statistical significance at the level of .05.

The results of research found that truck drivers have a positive attitude towards switching to NGV in terms of engine performance safety, easy to maintenance, maintenance center, environmental impact and overall performance. Especially in terms of price and safety can be considered as the most important driver from doing the test, also found the concerns of the driver both NGV stations that are not enough. Maintenance is quite difficult and the engine performance that may be impaired compared to using diesel. However, there is a tendency that drivers will support the company switching to NGV in order to reduce transportation costs and able to compete in the market.

Keyword: Natural Gas for Vehicle, Diesel fuel, truck drivers, transportation

INTRODUCTION

Transportation is very important for logistics management. If there an inefficient management, it will become the cost of the company. The company that has studied is a company which operates the business of transporting cars from the manufacturing plant to the port for export with real-time monitoring and tracking system (GPS) to locate and send information through the network with modern technology confident in delivering products safely and focusing on providing efficient services. Therefore, being one of the leading automobile transportation companies in the country that has been trusted by users for a long time.

This company provides car transportation services, therefore the logistics activities of most companies are mainly focused on transportation. The current transportation route from the customer's car factory to Laem Chabang Port, Chonburi province. Each factory will have a distance 100 - 400 kilometers, when costing according to the logistics activities of It can be seen that the company has a total cost of up to 71 million baht per year divided into 1. Administrative expenses which are expenses related to employees in various positions. This cost is accounted for 43% of the

total cost. 2. Transportation management expenses which are costs associated with fixed costs such as vehicle depreciation, insurance fees, vehicle registration fees and variable costs such as fuel costs. Maintenance costs, rubber costs, expressway costs and special staff allowances according to the car trip which the variable cost depends on the distance oil prices and number of trips in the service of the company. This cost is 55% of the total cost. 3. Communication costs such as software installation fees GPS system installation fee, telephone bill, internet service charge, which cost is 1% of the total cost and 4. Other expenses are general expenses of the company such as office or administrative expenses and other miscellaneous expenses. This cost is 1% of the total cost.

A transportation management expense is the highest proportion of cost compared to other expense. Especially the cost of diesel fuels which the company has been directly affected by the price increase of oil price in the world market. As a result, the competitiveness and profits of the company are reduced. Therefore, switching to NGV is another option that the company is interested
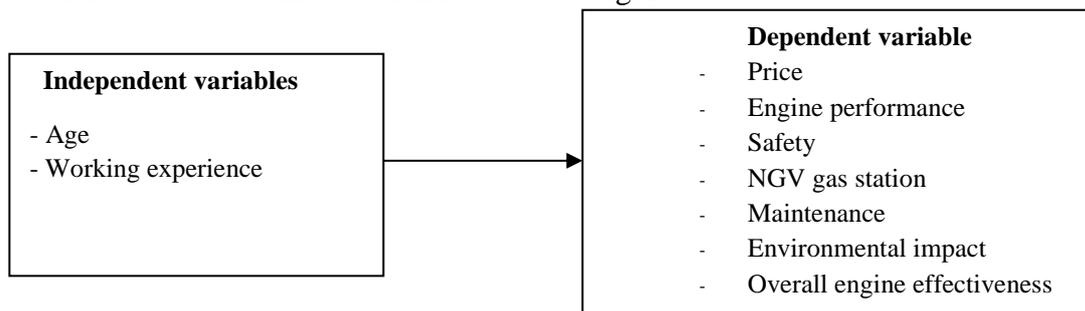
Therefore, the company has an idea to adjust the management strategy. In order to have a competitive advantage in the business including the study how to use NGV instead of diesel to reduce transportation costs. By inquiring the attitude of the driver of the company with the use of NGV in the field of knowledge about NGV, confidence in various aspects such as price, engine performance, safety, service station, maintenance environmental impact and overall performance to be used as an information in the management decision of installing NGV for the transportation of the company. It also prepares the employees before using NGV with the company's vehicles in the future as well.

OBJECTIVE

1. To study the attitude of the transport company driver of the transportation company towards changing to use NGV instead of diesel fuel.
2. To study the information and guidelines for the decision of the executives in the installation of NGV for transportation vehicles of the company.

RESEARCH FRAMEWORK

Research framework of this research is shown in figure 1.

Independent variables

- Age
- Working experience

Dependent variable
- Price
- Engine performance
- Safety
- NGV gas station
- Maintenance
- Environmental impact
- Overall engine effectiveness

LITERATURE REVIEW

[1] Adul Jaturongkul (2000) refers to the concept of John C. Mowen and Michael Minor, which has a definition of attitude that 'The attitude is the core of feelings, preferences and dislikes of people, groups, situations, things and opinions that we cannot see. 'In terms of academics, the definition of attitude is that 'attitude is an inclination caused by experiences that create behavior in a manner that consistently shows preference or dislike of something'

[2] Chananan (2006) studied factors related to the opinions of motorists in using natural gas for cars (NGV): a case study of passenger cars (taxis) in Bangkok. The results of the analysis showed that difficult to start engine does not affect the engine acceleration has the effect of stumbling in the engine. Resulting in smooth engines. The price is not suitable for the market. The quality is not suitable for the price. The quality of NGV natural gas in each location is no different. NGV natural gas distribution channels should have 6 service channels; NGV natural gas service stations are not enough, NGV of the government is still low and education, gender, age, education level, occupation status and monthly income are related to NGV natural gas replenishment and NGV natural gas replenishment from the location as a passage.

[3] Chayada and Kraichit (2011) studied factors affecting motivation in choosing NGV natural gas, only large trucks in Samut Prakan province. The result of the base test revealed that different fundamentals. There is an incentive to choose NGV gas only for large trucks. In Samut Prakan Province, there is no difference. As for the marketing mix factors, there is an influence on the motivation of choosing NGV gas only for large trucks in Samut Prakan province. The marketing promotion factor has the most relationship, followed by product price and distribution channels other factors of consumers influence the motivation of choosing NGV gas only for large trucks. In Samut Prakan province which is related to the value factor the potential to increase productivity and the main benefits, respectively.

[4] Department of Energy Business (2011) NGV or Natural Gas Vehicles is natural gas for motor vehicles. Produced from natural gas (Mostly methane) compressed to a pressure of about 3,000 psi (The pressure is quite high, equal to 240 times the atmospheric pressure) and then stored in the tank. This is exceptionally strong, such as steel, to be used as a substitute for gasoline or diesel in various types of cars which is called Compressed Natural Gas (CNG) or compressed natural gas.

[5] Kitti-amphol Sudprasert (2017) studied the factors affecting the decision to use AEON credit cards for consumers in Nakhon Pathom province. The study indicated that most respondents were male, aged 31 - 40 years old. Most of them had a bachelor's degree, the occupation are private company employees. Average income per month is 20,001 - 30,000 THB. The hypothesis testing found that the marketing mix factors and the perceived benefits that affect the decision to use AEON credit cards of consumers in Nakhon Pathom province with statistical significance at the level of 0.05, while lifestyle patterns did not affect the decision to use AEON credit cards of consumers in Nakhon Pathom province.

[6] Wirunpan (1999) the satisfaction of the conclusion means that the feelings within the human mind are different, depending on how each person wishes to look for. If expecting or being very determined and well responded, will be very satisfied, but on the contrary, may be disappointed or extremely unhappy when not receiving the expected response. Depends on what he intended to be more or less.

[7] Wanli (2011) conducted a study of personal car users with different age, found that the behavior of using gasoline instead of gasoline was not significantly different at the level of 0.05, which is consistent with the documents and research that Related to Kongsak (2007) study the attitude of car users towards natural gas use for vehicles (NGV) in Mueang District, Lampang Province. It is found that those aged 31-35 years have reason to choose natural gas (NGV) because Want to help the nation Helping reduce air pollution and natural gas prices (NGV) with cheap prices that the price of diesel or benzene 91 or benzene 95 is in line with the research of Siriwan (2007) to study the factors that influence NGV gas consumption in Thailand. Factors that have been studied are related to the use of NGV gas because of the cleanliness properties. And reduce air pollution than other fuels which are good for users and the environment.

METHODOLOGY

1. Independent variables are age and work experience.

2. The dependent variable is the attitude of the driver of the transportation company. With the use of NGV instead of diesel fuel which consists of price, engine performance, safety, NGV station, maintenance, environmental impact and overall engine effectiveness.

3. Population and sample group. The population of this research is the company's transportation driver. There are 50 truck drivers by using the census sampling method or 100% sampling and can collect questionnaires for 49 people, holding 98% of the respondents.

4. Research hypothesis.

4.1 H_0: The age of the driver varies, are not affecting the attitude of switching to NGV instead of diesel.

H_1: The age of the driver varies, are affecting the attitude of switching to NGV instead of diesel.

4.2 H_0: The driver's work experience is different; are not affecting the attitude of switching to NGV instead of diesel fuel.

H_1: The driver's work experience is different, are affecting the attitude of switching to NGV instead of diesel fuel.

5. The tool used to collect data is a questionnaire. Researcher created was the attitude of the driver of the carriage towards the transition to NGV to replace diesel fuel. The questionnaire is divided into 3 parts as follows:

Part 1: General information of respondents, including age and work experience.

Part 2: Attitudes of transportation drivers towards NGV gas replacement for diesel fuel use.

Part 3: Other comments and suggestions

6. Data analysis.

6.1 General information for respondents, analyzed with frequency and percentage.

6.2 Attitudes of employees towards the transition to NGV gas used to analyze Mean and find the standard deviation (SD) for the average score analyzed. It used to interpret the meanings according to the theory of the Likert scale, which is very popular with questionnaires that measure attitudes by setting the format to the level of opinions of the respondents 1-5 levels as follows.

The average between 4.21 - 5.00 is the 'highest level'.

The average between 3.41 - 4.20 is the 'high level'.

The average between 2.61 -3.40 is the 'medium level'.

The average between 1.81 - 2.60 is the 'low level'.

The average between 0.00 - 1.80 is the 'minimal level'.

6.3 Analyze the relationship between independent and dependent variables to test the hypothesis by using One Way ANOVA and Scheffe model.

RESULTS

Part 1: General data.

1. The age of the majority of respondents aged over 40 years old, representing 41.8 percent of all respondents. The second is the respondents aged 30-40 years, representing 37.8 percent of all respondents. And third, those who responded to the questionnaire that were not over 30 years old, representing 20.4 percent of all respondents.

Part 2: The results of the analysis of the attitude of the driver towards the use of NGV instead of diesel fuel.

Factors related to the attitude of the drivers	$\overline{X}$	S.D.	Rating level
1. Price	4.16	0.57	High
2. Engine performance	3.36	0.83	Medium
3. Safety	3.66	0.83	High
4. NGV gas station	2.77	0.85	Medium
5. Maintenance and maintenance center	3.31	0.68	Medium
6. Environmental impact	4.20	0.72	High
7. Overall engine effectiveness	4.01	0.70	High
Total Average	3.64	0.74	High

The result of the analysis of the attitude of the driver towards the use of NGV instead of diesel fuel in 7 factors; price, engine performance, safety, NGV gas stations, maintenance and maintenance centers, Environmental impact and Overall engine effectiveness. Most drivers agree with the use of NGV instead of diesel fuel. If comparing the attitude of the employees in the details of each factor will be as follows.

In terms of price, this factor is high level ($\bar{x}$ = 4.16, S.D. = 0.57). The cost of using NGV is more economical than using diesel, followed by the fact that NGV prices are less volatile than diesel fuel. And the cost of installation is worth and the price is not too high respectively.

In terms of engine performance, this factor is medium level ($\bar{x}$ = 3.36, S.D. = 0.83). Drivers have moderate opinions or are not quite convinced. They agree that using NGV does not affect the acceleration or power of the engine while in use. And change diesel engines into NGV engines that do not affect driving. But they agree moderately that does not affect the wear rate of the engine.

In terms of safety, this factor is high level ($\bar{x}$ = 3.66, S.D. = 0.83). Drivers have very agreed that it is very safe for the drivers. Compare the equipment installed with quality and standard including having confidence in the safety systems while driving.

In term of the NGV gas stations, this factor is medium level ($\bar{x}$ = 2.77, S.D. = 0.85). Drivers have moderate level of opinion or are not quite convinced of the ease of access to NGV gas stations. The amount of the oil dispenser is sufficient and the adequacy of NGV gas filling stations respectively.

In terms of maintenance and maintenance center, this factor is Medium level ($\bar{x}$ = 3.31, S.D. = 0.68). Drivers have a moderate level of opinion or are not confident that the post-installation service is at a high level. But not affecting the renewal of the engine and the condition of the main equipment installed.

In terms of environmental impact, this factor is high level ($\bar{x}$ = 4.20, S.D. = 0.72). Drivers have a lot of opinions, Agree the most in helping reduce energy consumption from diesel fuel, soot from the combustion is less, reduce air pollution and protect the environment respectively.

In term of Overall engine effectiveness, this factor is high level ($\bar{x}$ = 4.01, S.D. = 0.74). Drivers have agreed that it is the most agreed with the policy of switching to NGV instead of using diesel. Agreed that it would reduce the burden on the diesel fuel of the

company which would result in an increase in the employee's return and the transition to NGV gas does not affect the operation, respectively.

Part 3: Testing the hypothesis
  The results of the comparative analysis of the attitude of drivers in using NGV replacing diesel fuel by using test statistics with one way variance (One Way ANOVA). Results are;
  1. The general conditions of drivers in terms of age. The result is different age ranges of drivers affect the attitude of switching to NGV instead of diesel fuel.
  Consideration of each employee's age range, comparing with the attitudes of each factor, it was found that drivers had a price attitude different from other attitudes. Drivers aged 30 - 40 years have different attitudes from drivers, whose age ranges from 40 years old, indicating that drivers with different age ranges also have different price attitudes.
  2. The general condition of the employees in the work experience has a test result is; the work experience of different drivers affects the attitude of switching to NGV instead of diesel fuel.
  Consideration of each employee's work experience, comparing with the attitudes of each factor, it was found that employees had attitudes in safety different with other factors. The work experience not over 1 year have different levels of attitudes in switching to NGV instead of diesel oil, with employees with 5 years of work experience showing that the work experience There are differences in the attitude of NGV gas safety.

CONCLUSION AND FUTURE WORK

  This study found that most drivers of transportation companies have knowledge, understanding and have a good attitude towards switching to NGV, which is consistent with the concept and theory of NVG gas that can be used to replace diesel oil. Thus saving logistics costs in transportation in terms of engine performance, safety, maintenance and maintenance center, environmental impact and overall engine effectiveness. Especially in terms of price and safety are the most important of drivers considered and executives should pay attention to. And also found the concerns of the driver, such as NGV gas stations that are not enough to meet the needs, the maintenance is quite difficult and the engine performance that may be impaired compared to using diesel fuel. These problems are issues that employees are still concerned about. However, there is a tendency that drivers will support the company in switching to NGV in order to reduce transportation costs and able to compete in the market.
  Based on the results of the study, the level of opinion knowledge and understanding of the driver of the transportation company which can be used as information for the management's decision in order to solve the company's problems in adjusting the management strategy and study the approach to change to use NGV to replace diesel fuel
  However, this transportation company should have knowledge training and provide various information about the use of NGV systems for all drivers to prepare in advance before the company will make adjustments in order for employees to have knowledge and skills confidence in safety and able to work efficiently.
  In accordance with the research of Wanli conducted a study of personal car users with different age, found that that the reason to choose natural gas (NGV) because want to help the nation reduce air pollution and natural gas prices (NGV) with cheap price.

ACKNOWLEDGEMENTS

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