PROJECT ON NATURAL GAS UTILIZATION IN TRANSPORT OF VIETNAM: ANALYSIS OF RESULTS FROM A SURVEY

Ta Van Giang
Transportation Expert
RITST
1252 Duong Lang
Hanoi - Vietnam
Tel.: 84.4.8340749
Fax.: 84.4.8343403
E-mail: RITST@hn.vnn.vn

Le Thanh Luu
Transportation Expert
RITST
1252 Duong Lang
Hanoi - Vietnam
Tel.: 84.4.8340290
Fax.: 84.4.8343403
E-mail: RITST@hn.vnn.vn

Nguyen Huu Duc
Doctor, Senior Expert
RITST
1252 Duong Lang
Hanoi - Vietnam
Tel.: 84.4.8340290
Fax.: 84.4.8343403
E-mail: RITST@hn.vnn.vn

abstract: Being aware of the importance of Natural Gas not only due to its economical benefit but more important to its contribution in environment protection, Vietnam started using Natural Gas as a fuel in transport very early. But in fact, with the large Natural Gas resources the natural gas vehicle in Vietnam has not reached its potential due to poor infrastructure and lack of understanding in technologies. So, a project on development of natural gas utilization in transport in Vietnam is in preparation. To do that, a survey has been conducted to record the attitude of the public on:
- Their understanding on Natural Gas utilized in transport,
- Their opinions on the development of the NGV program in Vietnam.
The paper resumes the process and presents an analysis on results from this study.

1. INTRODUCTION

1.1. Background

Since application of economic reform policy, the Vietnamese economy has been steadily developed with high growth rate. In this development, the transport sector contributes an important part. However, it brings also a great concern of air pollution in big cities such as Hanoi and HoChiMinh cities because the number of the secondhand vehicle is increased tremendously and they are either worn out or poorly maintained. To solve this problem and to replace a part of imported conventional fuel, the use of the natural gas is an alternative. It is more important in the context of Vietnam since a great of number of natural gas fields have been discovered and being exploited offshore of southern Vietnam. The NGV (Natural Gas Vehicle) program will open a new utilization aspect of this precious gas resource and bright prospect for Oil- Gas industry in Vietnam.

It is fortunately for our NGV program, after joining ASEAN in 1995, Vietnam became a participant in the New Zealand funded NGUT (Natural Gas utilization in Transport) program, which granted aid and technical assistance to member countries of ASEAN in order to conduct a feasibility study for giving better opportunities to develop an economic and environmental friendly alternative fuel. It will help in improving not only the local air quality but also the global one. However, due to its particular conditions that the infrastructure of gas industry in Vietnam has not been developed sufficiently, for example no availability of public gas pipe line network, data and information. Therefore, the NGV project in Vietnam at this moment is limited only in conducting a feasibility study, a small conversion program and other related training activities as well as technology transfer.

Van Giang TA, Thanh Luu LE and Huu Duc NGUYEN

1.2 Objectives of NGV Program in Vietnam

Rapid economic growth in Vietnam in recent years has resulted in the concentration of population and economic activities in the big cities of Vietnam such as Hanoi and Ho Chi Minh City. At present although the toxic matters in the air, such as lead and suspended particulate matter have not exceeded the acceptable levels yet, except in some heavy traffic crowded districts of Hanoi and Ho Chi Minh City, it will become a serious problem in the near future if no prevention measures are taken. Thus, one of most important objective of NGV program in Vietnam is to increase the awareness and to convince the government, public that NGV could play an important role in solving the environmental problem in big cities.

Apart from the fact that NG can replace a part of imported fuel, with a enormous resource of NG in Vietnam the price of NG is surely cheaper than other fuels. Training Vietnamese staff and conducting technology transfer aiming at providing the know-how of the conversion technology and other related matters are very important.

Three principal objectives of this feasibility study are:
- To work out a development plan of NGV program in the near future in Vietnam including suggestion of infrastructure construction of Gas industry with taking into consideration of NGV program.
- To select the most suitable vehicle type to use natural gas and the appropriate vehicle conversion technology for gas application in the special context of Vietnam that its vehicle-fleet is diversified in term of type as well as imported countries.
- To define the probable locations and scale of the NGV program feasible to apply.

Associated objectives specific to the NGUT program:
- To build a small compression gas plant in Thai Binh Gas Company serving the demonstration program by converting a mini bus run by petrol to natural gas fueled vehicle in the short term and as the first background of the NGV in Vietnam for long term.
- To make policy makers aware of the importance of NGV program in solving the problem of environmental pollution and fuel in urban transportation.
- To train technical staff to master the selected conversion technologies, NGV operation and management.
- Determining the issues and parameters to be tested during the program such as vehicle power and composition of emissions

II. IMPLEMENTATION OF THE SURVEY

For the Vietnamese public and even for some transport policy makers, NGV is new issue. Therefore, making the public and the concerning authorities aware of the importance of NGV not only due to its economic benefits but more important its contribution in environment protection as well as improving general understanding in NGV is one of the objectives of the feasibility study of the program.

In order to get general opinion of the public and interested circle on NGV program, we have carried out a survey of interested people. The survey aimed at studying general understanding of the traffic users on NGV. As mentioned before, NGV is a new issue not only for the people but also for many officials in transport sector. Therefore, besides collection of information, the survey aimed at promoting NGV in the public, especially in

the urban public transport. Due to the special feature of the survey that the objects of the survey were bus passengers in different bus lines in Hanoi, Ho Chi Minh City, the technical circle including car owners, drivers, concerning officials of urban public transport, environment, gas industry sectors. The questionnaire was set up in such a form that the responses may reflect and content all necessary information (please see the attached annex). The questionnaire was distributed to 600 people in Hanoi and Ho Chi Minh City. The collected information was analyzed by statistic method. Based on the analyzed results of psychology of the respondents, an adequate plan for the development of the NGV program will be worked out.

III. ANALYSIS OF SURVEY RESULTS AND SUGGESTIONS

After distributing 600 questionnaires, the number of valid responses in both Hanoi and HoChiMinh City is 412. The detailed results are shown in tables 1,2,3,4 of ANNEX 2. It is shown that the rate of valid responses is not very high approximately 69 % because many questioned people have never heard of NGV.
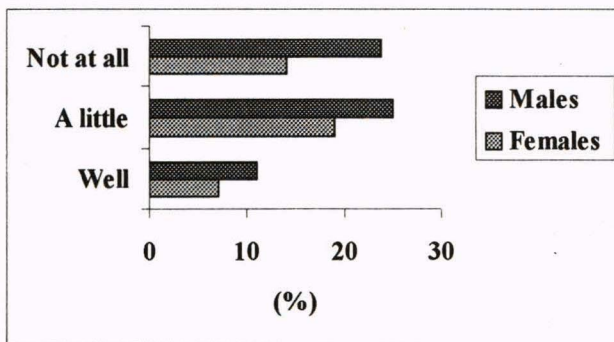
Analysis from question 1

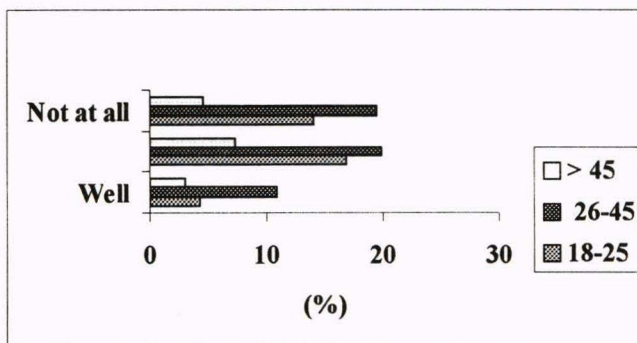Figure 1.1 General understanding level on NGV by sex

Figure 1.2 General understanding level on NGV by age
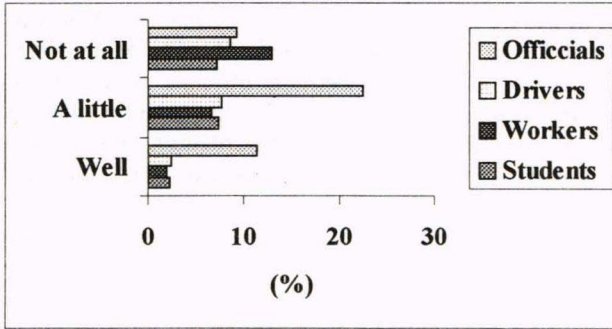
Van Giang TA, Thanh Luu LE and Huu Duc NGUYEN

Figure 1.3 General understanding level on NGV by occupation

The statistic results of question 1 show that the knowledge of NGV is not subject to sex. The rate of males is approximately equal with the rate of females (51%: 49%), but it depends upon age, occupation. Most of valid responses mainly belong to people whose age is about 26-45 (occupied 50.1% of questioned people and 31.7% of positive answers); the highly educated people or the people with jobs relating to gas industry, public transport, environment also have good understanding on NGV.
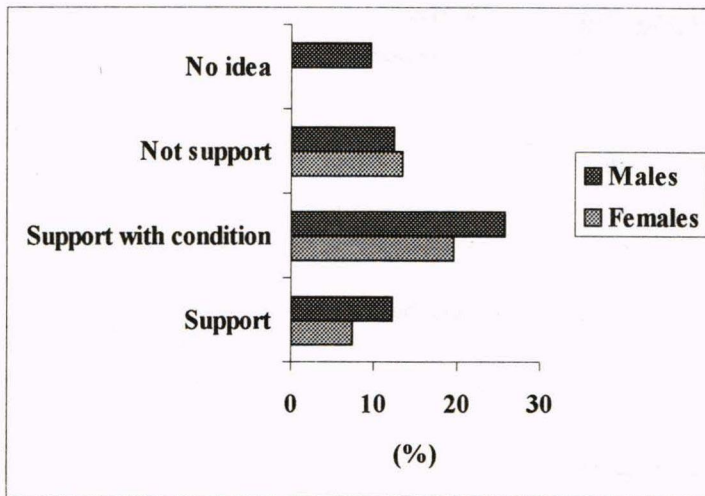
Analysis from question 2

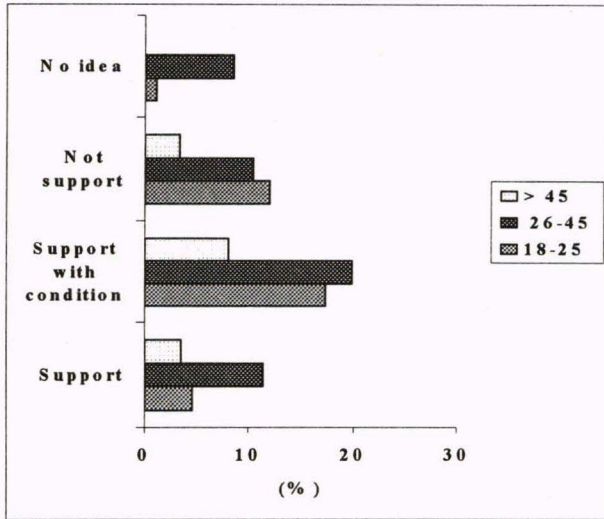Figure 2.1 Supporter rate on NGV by sex
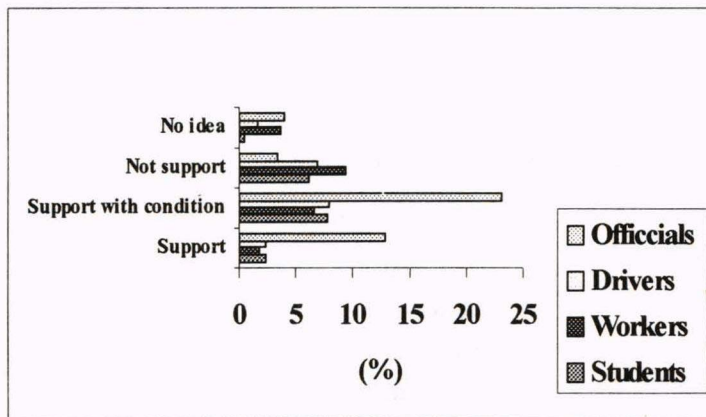
Figure 2.2 Supporter rate on NGV by age

Figure 2.3 Supporter rate on NGV by occupation

The rate of female with answer "not support" is higher than that of male. This may be due to women's psychology, but in general, both women and men have answers "support" and "support with condition". Similar to the results of question 1, the people at ages of 26-45 or who are officials of transport, environment sector, gas industry, government occupy a high rate of supported people.
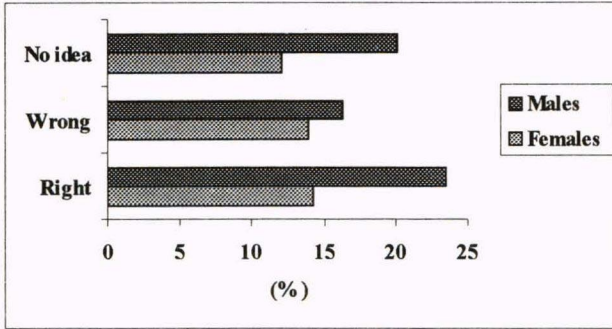
Analysis from question 3,4

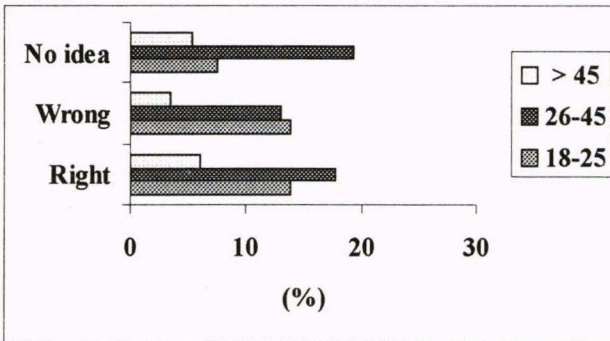Figure 3.1 Evaluation of visible advantages of the NGV by sex

Figure 3.2 Evaluation of visible advantages of the NGV by age
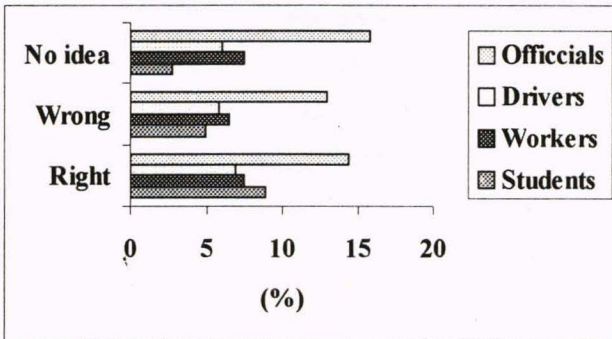
Figure 3.3 Evaluation of visible advantages of the NGV by occupation
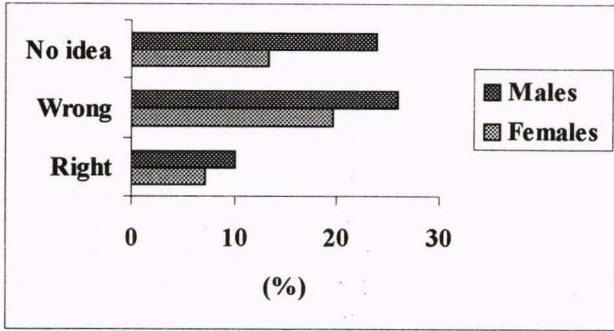
Figure 4.1 People's opinion in application of the NGV by sex
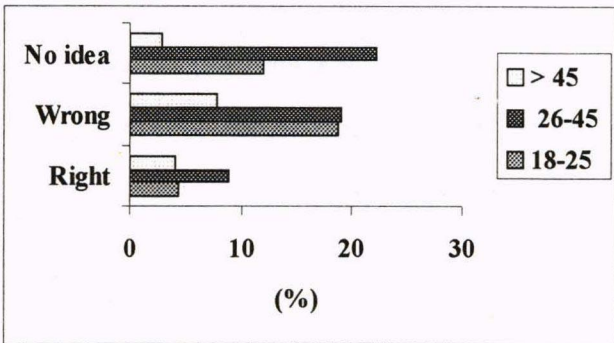
Figure 4.2 People's opinion in application of the NGV by age
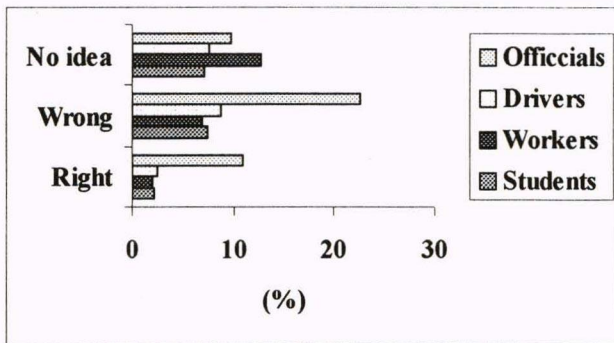
Figure 4.3 People's opinion in application of the NGV by occupation

These questions are more concerned to technical understanding on NGV than question 1, so many men and women at every age, type of job or event many officials of public transport, environment sector, government chose answers " wrong" and "no idea". It may be implied that most of Vietnamese people are vague on NGV.

IV. CONCLUSION

Few people had a good understanding of NGV. The people who have good knowledge on NGV are mainly educated people or their job more or less are concerned with technique. Although they are very vague about the technical matters as well as the benefits of NGV, most of the people would strongly support for a NGV program. Therefore, in order to improve the understanding level of the people, it is important to organize a wide advertising campaign on NGV by all mass media such as on TV, newspaper with the motto "For a healthy environment in transport" and the NGV technology should be introduced in universities. To do this, it needs the co-operation, support of the government and other concerned authorities. In the framework of this program, it is planned to hold some workshops and a seminar on technology transfer.

The remaining problem is that the natural gas resource in Vietnam is great, but how to develop the NGV program is depended on policies of government in transport sector and gas industry, as well as partly on the outcome of this project. Foremost, the infrastructure of gas industry must be developed, a suitable plan for development of urban public transport should be worked out to encourage the application of NGV.

REFERENCES

David Young (1997) Draft of Term of Reference of the Natural Gas Utilization in Transport Program in Vietnam. (1997), Worley Consultants Ltd. Wellington, New Zealand.

The Research Institute for Transportation Science & Technology (1998) Survey report on NGV program. Hanoi, Vietnam.

ANNEX 1

Form of questionnaire for the development of a natural gas vehicle (NGV) in Vietnam

I General information

1) Name
2) Age: 18-25   25-45   >45
3) Sex: Male   Female
4) Working place   Hanoi   HCMC
5) Occupation
    -Student
    -Worker
    -Driver
    -Official of transport sector, environment sector, gas industry, government

II Questions

1) To what extend do you know about NGV ?
    -Well
    -A little
    -Not at all

2) A NGV program may be developed in our city. What is your idea on this?
    -Support
    -Support but with condition
    -Not support
    -No idea

3)The main reasons for supporting NGV program in Vietnam are good for environment, replacing a part of imported fuel, abundant resource of gas. Choose one of thee following options:
    -Right
    -Wrong
    -No idea

4) If NGV would be developed in Vietnam, the concern when using would be safety during operation and high cost of conversion equipment. Choose one of three following options:
    -Right
    -Wrong
    -No idea

Van Giang TA, Thanh Luu LE and Huu Duc NGUYEN

ANNEX 2

1) Statistic results of question 1:

Table 1 Key social characteristics of respondents by groups

	Answers		
	Well	**A little**	**Not at all**
Sex			
Females %	7.1	19	14
Males %	11	25	23.9
	18.1	**44**	**37.9**
Age			
18-25 years of age %	4.3	16.8	14
26-45 years of age %	10.8	19.9	19.4
Over 45 years of age %	3	7.3	4.5
	18.1	**44**	**37.9**
Occupation			
Students %	2.2	7.3	7.1
Workers %	2	6.6	12.9
Drivers %	2.5	7.6	8.6
Officials of transport sector, environment sector, gas industry, government %	11.4	22.5	9.3
	18.1	**44**	**37.9**

2) The statistic results of question 2:

Table 2 Key social characteristics of respondents by groups

	Answers			
	Support	**Support with condition**	**Not support**	**No idea**
Sex				
Females %	7.3	19.5	13.3	0
Males %	12.1	25.8	12.4	9.6
	19.4	**45.3**	**25.7**	**9.6**
Age				
18-25 years of age %	4.6	17.4	12	1.1
26-45 years of age %	11.3	19.9	10.4	8.5
Over 45 years of age %	3.5	8	3.3	0
	19.4	**45.3**	**25.7**	**9.6**
Occupation				
Students %	2.4	7.7	6.1	0.4
Workers %	1.8	6.6	9.4	3.7
Drivers %	2.3	7.9	6.9	1.6
Officials of transport sector, environment Sector, gas industry, government %	12.9	23.1	3.3	3.9
	19.4	**45.3**	**25.7**	**9.6**

3) Statistic result of question 3

Table 2 Key social characteristics of respondents by groups

	Answers		
	Right	**Wrong**	**No idea**
Sex			
Females %	14.2	13.9	12
Males %	23.5	16.3	20.1
	37.7	**30.2**	**32.1**
Age			
18-25 years of age %	13.8	13.8	7.5
26-45	17.8	13	19.3
Over 45 years of age %	6.1	3.4	5.3
	37.7	**30.2**	**32.1**
Occupation			
Students %	8.9	4.9	2.8
Workers %	7.5	6.5	7.5
Drivers %	6.9	5.8	6
Officials of transport sector, environment Sector, gas industry, government %	14.4	13	15.8
	37.7	**30.2**	**32.1**

4) Statistic results of question 4

Table 2 Key social characteristics of respondents by groups

	Answers		
	Right	Wrong	No idea
Sex			
Females %	7.1	19.7	13.3
Males %	10.1	26	23.8
	17.2	**45.7**	**37.1**
Age			
18-25 years of age %	4.3	18.8	12
26-45 years of age %	8.8	19.1	22.2
Over 45 years of age %	4.1	7.8	2.9
	17.2	**45.7**	**37.1**
Occupation			
Students %	2.1	7.4	7.1
Workers %	1.9	6.9	12.7
Drivers %	2.4	8.8	7.5
Officials of transport sector, environment Sector, gas industry, government %	10.8	22.6	9.8
	17.2	**45.7**	**37.1**