

A STUDY OF THE CUSTOMERS PREFERENCE OVER HYBRID AND DIESEL FUEL CARS: A REVIEW OF URAN TALUKA

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Abstract:

Pollution free environment is the necessity for today's world. So the preference of customers is changing from traditional fuel cars to hybrid fuel cars. The factors considered for this study were income, locality, brand preferences and spending capacity. The present research paper covers the study of Uran taluka and covering 150 respondents. The chi square test was used to study the association between locality and preference of fuel cars. And we concluded that locality as a factor has more impact on the preferences of customers over hybrid and diesel cars.

Keywords: *Customer preferences, Hybrid fuel.*

Introduction

Fuels have a vital role in the daily consumption of consumers. Natural gas is being pushed as an alternative to fuels like diesel to power truck fleets. Diesel is synthesized from refining crude oil. Diesel prices fluctuate throughout the year not only because of crude oil prices, but because in winter, refiners make a tradeoff between diesel and compressed natural gas. In a perfect world, diesel would always be cheaper than gasoline because it costs less to produce. Natural gas costs less to produce than diesel. The mileage of diesel car is more as compared to the CNG. A diesel engine requires a spark plug and thus offers higher compression. It makes the diesel car more fuel efficient as compared to the CNG version. Both CNG and diesel variants have their benefits

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and disadvantages here. While a diesel car has a major advantage of low fuel cost and better mileage, it's expensive than CNG in terms of service and maintenance. As over many years, people have been using diesel cars but now due to introduction in hybrid cars, people have more turned to hybrid cars. Now, the question arises that, Why should one choose a petrol & CNG car over other? So the answer was CNG being a compressed natural gas contains more energy and the price is also low compared to diesel. It has been recognized as one of the promising alternative fuel due to its substantial benefits.

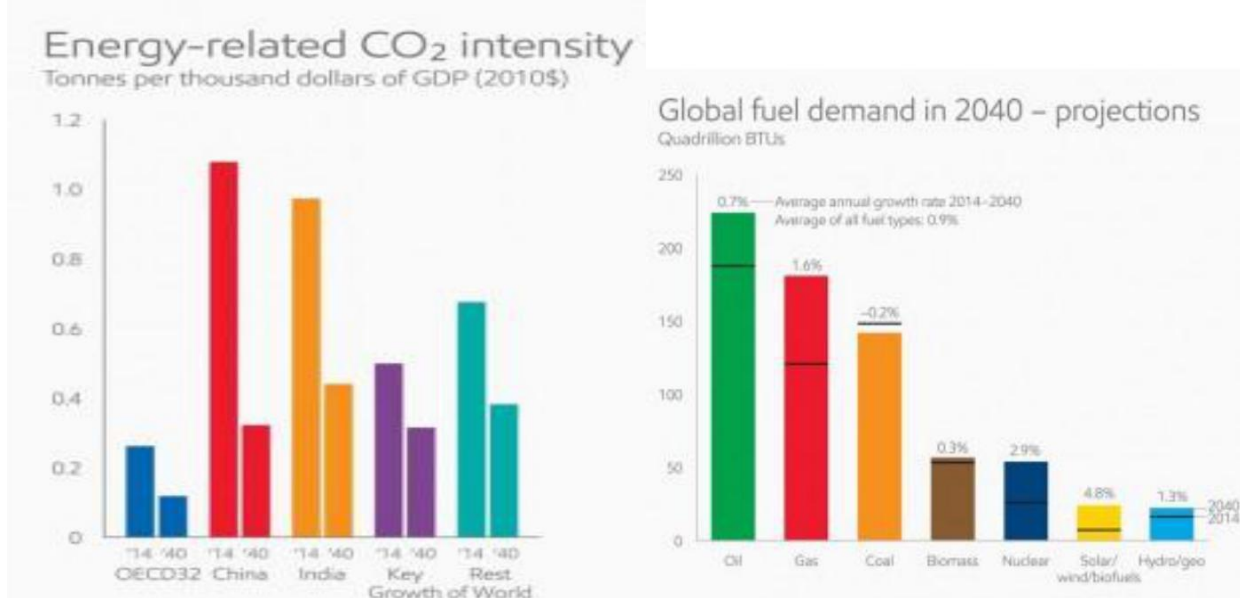
So, many of the car drivers have a different preferences over the fuels they use. They may be the rise of such fuel that leads to decrease in the demand for another. Both CNG and diesel have more demand in the market due to low prices as compared to only petrol. As in Uran, the fuel preferences depend upon the locality or income or standard of living. Although, the income may be high but it's on the consumers what they are willing to spend. It also depends on the station i.e. CNG or diesel where it is available. So, as there is no CNG plant in Uran but the consumers are ready to go to another locality and fill up CNG. The distance travelled is more so they have to cut down cost and they look after such engine which are better, efficient. And as eco-friendly environment. Hybrid cars also help to reduce pollution and also they are cars of the future. Leading to more efficiency, people tend to attract towards such cars leading to more sales.

Need

Natural gas saves consumers money. If it's not going to be nuclear, it's got to be gas.

Natural gas is abundant and the globalization of the gas market is accelerating. Unconventional gas is driving unconventional oil production. Unconventional oil production is stimulating the U.S. petrochemical sector and global oil production. Increasing regulatory pressure on the coal sector is leading electricity generators to switch to natural gas. Low-cost natural gas means lower-cost electricity. Two key trends— decarbonization and urbanization—favor increased use of natural gas. Global electricity demand is growing rapidly. Therefore the need for fuels which are cost effective, efficient, and environment friendly is increasing.

Scope



The above graph depicts the use of CO₂ in the year 2014 and in the future year 2040. In the recent years, as we can see that there is a hike in the consumption of carbon dioxide whereas in the coming years, it may decrease due to more consumption of other fuels. In the other graph, we can see that as compared to oil, there is significant increase in the consumption of gases in future.

Review Of Literature

A dual fuel diesel engine is a diesel engine fitted with a dual fuel conversion kit to enable use of clean burning alternative fuel like compressed natural gas. Dual fuel engines have number of potential advantages like fuel flexibility, lower emissions, higher compression ratio, better efficiency and easy conversion of existing diesel engines without major hardware modifications. In view of energy depletion and environmental pollution, dual fuel technology has caught attention of researchers as a viable technology keeping in mind the increased availability of fuels like Compressed Natural Gas (CNG). It is an ecological friendly technology due to lower PM and smoke emissions and retains the efficiency of diesel combustion. Traditionally dual fuel technology However its use for automotive engines has been limited in the past due to constraints of limited supply of alternative fuel.

A research paper was presented by B.B. Ghosh, P. K. Bose, ranjeet Kumar Chakravarty and Kalyan Kumar Das on "Application of CNG in transportation sector- A review of current status

and Technology and future projections”. They described that CNG has great potential as substitute of petroleum fuels. CNG can also play vital role in relieving the fuel crisis world over as a future source of energy as well as cleaner fuel. Full replacement of petrol in petrol engine with CNG is not a problem but in the case of diesel with CNG. They conclude that the existing SI engines can be operated with 100% substitution of CNG in place of petrol.

Adwait A. Jadhav and D. B. Hulwan from Vishwakarma Institute of Technology, Pune, Maharashtra, India presented a practical approach towards simulation of dual fuel (Diesel-CNG) engine of off road vehicle”. The paper highlights the simulation of dual fuel engine in 1-D Simulation software to study the combustion and performance characteristics of the engine. It consists of research on experimentation & simulation of dual fuel (Diesel-CNG) engine of off road vehicle. It is novelty to introduce first time in India. Research is carried out in Pune. The conclusion was drawn as

- Dual Fuel combustion strategy is an optimum solution to reduce NO_x and PM emissions from diesel engine and being more efficient.
- Combustion pressure rises as CNG is fumigated into the air in dual fuel mode.

Research Gap

In the past studies, many research papers were presented about the use of CNG in many sectors such as transportation etc. So our study mainly focuses on the how customers make their choices about the use of fuel cars based on various factors. There was a need to know what the people of semi-urban and rural areas want. So, to further contribute to the past studies, we surveyed to find out exactly what, how, and which factors affect the preference of customers. This would help us know that although having a diesel plant in their locality, why people are travelling to another locality to fill up their CNG tank.

has been popular for large engines like marine, locomotive and stationery engines

Objectives

To study the association between locality of the respondent and preference of the diesel or hybrid cars. Hypothesis to be tested

Null (H₀): There is no association between locality and preference of customers over diesel and hybrid cars.

Alternate (H1): There is association between locality and preference of customers over diesel and hybrid cars.

Research Methodology

This study was descriptive in nature and survey methods were used to complete the study. The survey was conducted on non-random basis as specifically quota was utilized. The sample size for this study was of 150 car drivers. The population was taken of Uran region. For data collection, a self-designed questionnaire was administered. The questionnaire had a face point Likert type scale, where 1 indicated maximum frequency and 5 indicated lowest frequency and also Gutsman scale was used. The demographic data was collected for respondents on the basis of gender, locality and income. The collected data was subjected to chi square test through SPSS software.

Results And Discussion

The data was collected in the month of November 2017. And in this study chi square test is used to know the relationship between the variables like locality, gender and monthly income.

Crosstab

Count

		FUEL PREFERENCE		TOTAL
		DIESEL	HYBRID	
LOCALITY	RURAL	0	40	40
	URBAN	40	70	110
TOTAL		40	110	150

Chi square test is used to analyse the association between locality and preference of customers over diesel and CNG fuels.

The value of computed Chi square is 3.967, which is significant at 5% level of significance. This is so because the p value for this is 0.054 as shown in the significance (2 sided) in the computer printout, which is lower than 0.05, the assumed level of significance. Since the chi-square value is significant it means we reject the null hypothesis and we accept the alternate hypothesis. That means there is association between the locality and preference of customers over diesel and cng fuels.

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-square	3.967 ^a	1	.054

Conclusions

Since in this research paper, all the population is turning towards petrol+cng fuels whether it affects their income or gender. Here, we can conclude that people are more in support towards petrol + cng fuels rather than diesel. By Chi square test we found out that there is relationship between locality and preferences. So whether they are in urban or rural they prefer cng more than diesel. And there is no association between other factor variables such as income and gender. So more preferences is on the locality which will define the use of petrol +CNG fuels more.

And also they suggest that petrol and cng price should be decreased, engine should be made more efficient. Decrease in fuel charges and increase in fuel pumps to minimize the crowd and CNG cars should be used to reduce pollution.

Suggestions

The suggestions we got from the study were that people are more inclined towards the use of CNG fuel cars. So it suggests a need to set up more CNG plants in the rural and semi urban areas as there is more demand for this fuels. The government should look forward for the growth of CNG plants as it would also reduce pollution and lead to sustainable development. And also the corporates can contribute through the CSR activities.

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