

CHAPTER 1

INTRODUCTION

1.0 Introduction

Malaysia as one of the developing country, a lot of factors are needed to be prioritized by the government. As the technology and gadget are well developed in our country, the transportation and industry also undergo some increment in term of the quantity. Most of the people in Malaysia are prefer to have their own vehicle to travel from one place to another. Hence, the air pollution needs to be prioritized by the government as most of the vehicles are emitting the harmful gases from the combustion of the petrol. One of the articles from the internet state that 527,700 death a year are the number that needed to be kept for India due to air pollution. Furthermore, The United States of America also faces death due to air pollution to an amount of 41,200 annually. In 2012, it was reported around 7 million deaths was due to air pollution. These statistics of death that cause from the air pollution are needed to be known to the government as we need to take some precaution before it happens to our country.

The Malaysia Department of Environment and other offices are concerned with the air pollution and it is needed to be controlled by enabling the implement pollution control measures. The target area is the greater urban areas such as Kuala Lumpur and other capital of each of the states in Malaysia. The Malaysia Department of Environment is advised by this project in developing and implementing a modern air pollution control policy at the national level. The joint solutions are developed for monitoring compliance with these limits. The most important thing is the fuel quality improved, so this can help to reduce the emission from the old vehicles and meet modern exhaust emission standards for the new vehicle. Furthermore, it also can improve the quality of data on the causes and effect of the air pollution which can give the authorities to an effective basis for environmental policy decisions. Next, at the municipal level, they already promote the local public transport and non-motorized transport to their people so that it can reduce the usage of vehicles on the road.

As the safest and cheapest fuel for this period of time, natural gas, it is emitted and burned to generate the energy to the cylinders in the cleanest way. By this clean and efficient fuel consumption, it can make the city and world to have a cleaner environment with the less percentage of air pollution.

We as the students of Engineering Technology in UMP, built up a team to generate the first NGV car in our university. This thesis will present the method to add-on the NGV system to the Proton Waja 1.6L with a CamPro engine, and also the result of the test on emission and mileage usage for both petrol and CNG.

1.1 Introduction to Project Objectives

For this project, we use Proton Waja 1.6L with CamPro engine as our vehicle to be add-on the NGV system. This project basically called make the car as the hybrid car which means it can use both of the petrol and CNG fuels. From our research, there are two types of NGV systems known as mixer NGV system and sequential NGV system. Both of these systems have their own requirements, as for the mixer system, the carburetor type engine is suitable for this system while for the sequential system, it is recommended for the fuel injection type of engine. So for this Proton Waja, the sequential system has been used since the engine is fuel injection type. Besides it is a more suitable system for the Proton Waja, it is also has a lot of advantages compared to the mixer system.

Next, this project also one of the methods for us to access the emissions reduction effected from the car with the NGV system. The natural gas is clearly better than the petrol as it is stated in the table of carbon dioxide emission. (Table 1.1) This gas is safer because of it is naturally colorless, odorless and also tasteless. Other than that, this natural gas emission gives less atmosphere-harming carbon dioxide compared to the petrol fuel which generates more harmful particles as it can pollute the air. Malaysia as one of the developing country, the air pollution needed to be considered more because of the industry and transportation are being used widely around the country. The effects of the air pollution can make all of the people suffer and live in an uncomfortable place which needs to be prevented before it is happening.

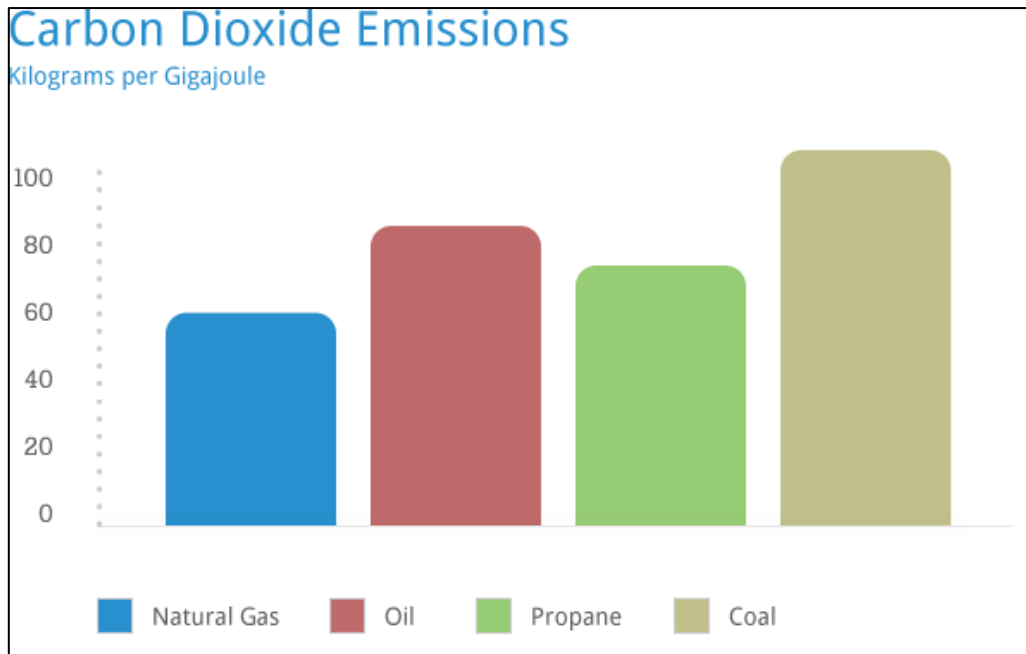


Figure 1.1: Carbon dioxide emission for various type of combustion

Source: www.infograph.venngage.com

Lastly, as we can see the petrol fuel price is unstable and quite high. If it is compared to the CNG price, the CNG is cheaper than the petrol fuel. This project can help us to evaluate the economic viability of the NGV car by determining its payback period. Before we make the evaluation, we need to compare the usage of the petrol fuel and the CNG per kilometer. By this comparison, we can make some calculation to determine its payback period for the NGV user, either it is efficient or otherwise.