



Reducing Climate Change for Future Transportation: Roles of Computing

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Abstract. For years, the fuels based vehicle has played a key role in the history of mankind. Such a type of vehicles has played it part not just as main transportation but also in many types of purposed as required of them. Currently, fossil fuels are the main sources of energy for the transportation mode around the world. Burning of fossil fuels will release heavy and vast amount of carbon agents into the environment which detrimental effect to the nature, surrounding and the population of earth be it humans, plants or mammals. For that a solution to reduce the gas emission from fossil fuels vehicle to prevent more ill-effect to the environment is required. New technology such as fully Electronic Vehicles (EVs) is considered as one of the best solutions to mitigate this problem. With the integration of Computing or Information and Communication Technology (ICT) can help to further improvise this future transportation and at the same time can reduce its negative impacts. This paper will review selected articles and papers published between 2001 and 2019 that contain information and terms that related climate change, global warming, environment, future transportation and computing technology. These articles were further inspected and the decision for its inclusion and exclusion were mediated to develop a comprehensive review on global warming issues that are related to transportation and how ICT can assist in mitigating them.

Keywords: Electronic vehicle, climate change, global warming environment, future transportation, computing technology.

1 Introduction

The development of speedy transportation is human's greatest accomplishment in minimizing the distances but at the same time it has also become a main cause of environmental degradation [1]. It can be treated using smart management for new futuristic transportation ways [2]. If we fly into any main city all around the world, you will be greeted by a familiar sight looking like sheen of brown smog that floats over a city. This smog comes mostly from cars and this is one of the problems caused by current modes of transportation and their fuel. Along with this smog comes carbon dioxide

(CO₂), the gas that is fully responsible for the climate change. Other main sources of pollution are in the form of gas and particulate matters emissions that affect air quality causing damage to human health. As stated by [3], the most common gas includes Carbon Monoxide (CO), Nitrogen Oxides (NOX), benzene, silicon tetrafluoride and others. It is clear that very large amount of pollutants is being emitted from various forms of transport into the air that we breathe.

All of these emissions are also responsible as it affected the environment with the global warming issue. According to [4], the major types of current fossil fuels used in the transportation sector in Malaysia include natural gas, Motor gasoline, Aviation gasoline and Aviation Turbine Fuel. Diesel oil and fuel oil Natural Gas fuel make a mixture of gaseous hydrocarbons (mainly methane) which occur either in gas fields or in association with crude oil in oil fields [4]. The most noticeable way for us to achieve a reduction in pollution by motor vehicles is by reducing the emission of fumes at the source. A quick-term solution has to be made by medications to the current type of engine, maybe by improving the combustion part within the exhaust system and created a future fuel that are save for the environment and can reduce the pollution as well [4].

In addition, the current modes of transportation and their fuel have caused many problems to our environment. Transportation like cars, motorcycle and aviation industry are major users of energy and burn most of the world's fuel. With this, they are creating air pollution which includes nitrous oxides and other particulates and this is significant contributor to global warming through emission of carbon dioxide which is dangerous and harmful to environment [3]. Other than that, it also gives an impact to automobile-oriented urban sprawl which can affect the natural habitat and agricultural lands. Furthermore, even there are so many problems to environment that had been seen but still the demand on private vehicles like cars and motorcycle is still high and at the same time, the transportation industry keeps on producing new cars or other private vehicles to satisfy their customers.

Computing or Information and Communication Technology (ICT) carries an important role in the futuristic transportation mode [5]. Market of ICT has been striving and has been launching latest applications and technologies which guide and help in shifting transportation to another level while still focusing on long term and short term effects on environment [3]. ICT has a high potential to raise future technologies efficiency and at the same time it does its cause to reduce negative impacts. For example, an autonomous car will not pollute the environment as how the motor vehicle does [6]. However, these technologies would cost highly and are affordable to have frequent maintenance and would wear or tears due to insufficient monitoring and maintenance. Hence, this car will have to be controlled and monitored so any issues found would be noticed and immediately fixed and ensuring car is in a good condition as well as the surroundings. A simple graphical representation is depicted in Fig. 1 in order to provide readers a more explanation on what this paper is going to resolve such an issue.