Green Vehicles, Incentives and Policies: A View from Logistics Companies in Malaysia

Nur Fadiah Mohd Zawawi1,*, Mohd Rafi Yaacob1, Sazali Abd Wahab2, Khairil Wahidin Awang3, Samihah Ahmed4, Ruslee Nuh5

1Faculty of Entrepreneurship and Business, Universiti Malaysia Kelantan, City Campus, Pengkalan Chepa, 16100 Kota Bharu, Kelantan, Malaysia.
2Putra Business School, Office Building of the Deputy Vice Chancellor (Research and Innovation), 43400 UPM Serdang, Selangor, Malaysia.
3Faculty of Hospitality, Tourism and Wellness, Universiti Malaysia Kelantan, City Campus, Pengkalan Chepa, 16100 Kota Bharu, Kelantan, Malaysia.
4Malaysian Technology Development Corporation, Ground Floor, Menara Yayasan Tun Razak, Jalan Bukit Bintang, 55100 Kuala Lumpur, Malaysia.
5Faculty of Islamic Sciences, Prince of Songkla University Pattani Campus Rusamilae, Meang Pattani, 9400, Thailand.

*Corresponding author: rafi@umk.edu.my

Abstract. There are limited green solutions have been offered to reduce pollutions caused by logistics transportation as compared to passenger vehicles. Thus, this paper aims to reveal insights from logistics companies on the perspective of policies of sustainability including financial and non-financial incentives from the government of Malaysia in assisting them to obtain socio-environment sustainability and consequently to contribute to the effectiveness of the country’s Sustainable Development Goals. To achieve this objective, data were gathered from 134 logistics companies in Malaysia, listed in the Malaysian Logistics Directory 2018/2019. They were analysed using IBM SPSS Statistics 25 software. Utilizing descriptive and correlation analyses, the findings indicated that logistics companies inherently need government support in terms of incentives and supportive policy in order to attain the country’s socio-environmental sustainability. Based on the findings, this paper, firstly suggests that the government needs to find a better solution to reduce the environmental impact from logistics transportation from its root, which is achieved by integrating green motor vehicle into logistics transportation. Secondly, the government should develop relevant sustainable policies which guide logistics companies to comply accordingly. This study contributes a new insight into socio-environmental sustainability of logistics industry.

1. Introduction

Environmental pollution due to vehicles’ emission has been discussed widely over the past two decades. Countries with high traffic volumes of transportation activities face big problem of environmental pollution. Indonesia for example, one of the biggest populations in the world recorded a 50% increased of carbon emissions level from 2008 till 2018 and an increase of 313% of greenhouse gas emission (GHG) from 1990 level [1]. Jakarta alone, the capital city of Indonesia had more than 8 million of population [2], making it the 10th on the list of most congested cities in the world [3]. Population and
transports are therefore contributing greatly towards the GHG emission level. In case of Malaysia, the carbon dioxide (CO2) emission increased dramatically from 126.5 million tons in year 2000 to 250.1 million tons in year 2019. These conditions intrude and impose challenges on the sustainable development of the world as promoted by the United Nations through Sustainable Development Goals (SDGs) or also called as the Global Goals. The main objective of the SDGs is to make a universal call to put an end to the poverty, protect the earth and to ensure people live in peace and prosperity by 2030 [40]. Thus, protect the environment is one of major focuses of SDGs.

Unnaturally, CO2 emission is caused by the combustion of fuel inside the internal combustion engine (ICE), both from spark ignition gasoline engine and compression ignition diesel engine. Although research and development has been done over 30 years ago on reducing the emission including reducing ICE emissions such as nitrogen oxides (NOx) and particulate matter by more than 99% to abide by EPA emissions standards [5], the residue emissions still accumulating day by day, therefore reaching the high level of GHG index. Hence, at international level, various efforts have been done to reduce this environmental pollution, including using Alternative Fuel Vehicle (AFV) [6] and the development of electric vehicle (EV) [7]. They are called as green vehicles (GV). According to United States Environmental Protection Agency (EPA), GV are vehicles which are more efficient and produce less pollution to the air [8]. The AVF and EV functions without gasoline or diesel, they operated based on electricity, methanol, biodiesel, propane, natural gas, hydrogen or ethanol [6]. Though some of these energy sources may produce heat-trapping gases and some other pollution, it still produces less compared to fuel-engine vehicles [9].

Though, till now, most efforts are concern on personal vehicles, without giving due attention to logistics transportation. Logistics transportation becomes a backbone to the world today especially in Covid-19 pandemic, as people under lockdown almost totally changed from physical buying to online purchasing either from locals or internationals. Hence, the significant surge of demand makes logistics companies increased the number of their vehicles especially for road transportation in order to ensure the delivery to end consumers reach them on the estimated time. This happened around the world. During the early hit of Covid-19 in March 2020, logistics services were highly demanded to cater medical and food supplies throughout the globe by using air freight and trucks. Simultaneously, logistics services were critically requested by the people who do online shopping due to lockdown [10]. In this time around, logistics service providers (LSPs) actively rearranged and added more vehicles in order to manage the drastically increased of delivery service especially road transportation like trucks and vans which were needed to complete the supply chain, from initial point like suppliers and ports, to the end point, customers [11]. In this sense, logistics vehicle should also not be left behind in the effort of reducing the environmental pollution, which then leads to socio-environmental sustainability.

Yet, the GV is price sensitive. Most people and companies need huge encouragement to opt for GV as they considered about cost of buying, efficiency, cost saving and reliability, especially for EV. Studies showed that they expected for government supports including policies and incentives to help them to adopt and use GV. Government of China, India and Europe for instance has developed their own policies in influencing their folks to involve in GV for the sake of protecting the socio-environment sustainability [12]. Therefore, against this background, the objective of this study is to view the insight of LSPs in Malaysia especially on the government roles in encouraging the LSPs to involve closely in sustainability efforts. This paper is divided into several sections. The first section discusses literature review, followed by research methodology, findings and discussion, research implication and last but not least is conclusion.

2. Literature Review

2.1 Financial and Non-Financial Incentives and Policies for Sustainability

Literature studies reviewed those matters regarding GV or hybrid vehicle always needed government support to influence people to choose them [12,13]. According to Gong, Ardeshiri, and Rashidi [14], this happened because there were some major obstacles in widespread adoption of the EV including cost
of purchasing, limitations of battery technology, lack of charging infrastructure and high cost of battery [15]. Additionally, consumers also less confident on the performance ability of the EV technology [16,17]. As a result, many countries like Australia, China, Bhutan and India have developed policies regarding this issue and using incentives mechanism to help improving the adoption of EV and other GV, as well as to overcome the available barriers [18,19]. Some countries offer investment supports for technology implementation, some give incentives to buyers and some provide infrastructure-related investment [14].

The government of India has taken this issue very seriously. Various efforts were done to encourage the usage of GV in the country for the purpose of reducing the GHG effects including the launching of National Electric Mobility Mission Plan 2020 (NEMMP) in year 2013 to promote EV. In its policy, the Indian government provides several incentives such as encourage research and development in enhancing technology of battery, testing infrastructure, system integration and promote charging infrastructure. Other than these incentives, the government also works on special scheme which an EV can be purchased zero of cost; zero down payments and monthly payments out of saving of fuel cost. Based on a study done on 220 respondents from manufacturing and service backgrounds in India, the data showed respondents are all set to accept the EV, but they expect the government roles to support such for the said cause [12].

In Bhutan, its government has a big goal to become the world leader of EV by introducing an enormous proportion of the government fleet. The government aims to change police cars, service cars, public transport, school busses, tourists’ vans and the government cabinet transport into EV to help reducing environmental pollution [20]. Moreover, in order to encourage their folks to use EV, the Bhutan government also suspended import duty and planned to reduce the import of fossil fuel by 70% in order to inspire their people to change to EV [21].

Currently in Australia, where it counters a very small EV market, some small incentives provided by the government such as discounts on energy bill and parking fees were well-received and helped them to slowly increase the demand of EV. Looking at the positive feedback, a survey was done in Australia upon 1076 respondents to study the type of incentives the people intended to have in order to own the EV. The finding shows that residents intended to have both financial and non-financial support from the government. As for financial support, the findings resulted into two categories which are one-off incentives and on-going incentives (operating incentives). One-off incentives cover rebates on the upfront cost and reduce the price as EV is price sensitive. The price of EV is quite high for middle-income categories thus these incentives were favorable among the respondents. On-going incentives included rebates on parking fees until 2025 and discounts on energy bills until 2025. Between these two, discount for energy bills was the most favorable among the respondents. Meanwhile, in terms of non-financial support, respondents only requested the government to provide access for bus lane for EV since traditional vehicles were not allowed to travel on the bus lane. This would save their travel time [14].

In Malaysia, the usage of GV is still relatively very low and in its infancy compared to traditional ICE vehicle. According to a study regarding the influencing factors of GV adoption in Malaysia among 107 respondents found that government tax incentives, sales incentives and fuel subsidy policy were significant factors to the adoption of hybrid vehicles. For example, the government tax exemption reduced the price of hybrid vehicle significantly compared to price without tax exemption. The price of Honda Civic hybrid was MYR162,800 without tax exemption, but the price only at MYR120,000 with tax exemption. This leads to increase the adoption of hybrid vehicle in Malaysia [22]. On the other side of coin, the Green Technology Policy 2009 and the National Automotive Policy launched by the government must be referred to allow this sector to accelerate and transform the automotive industry and to be one of important contributors for the national economy. However, some parties think that investment in public charging is still considered as expensive approach to save petroleum fuel [23].

Hence, from the literature review, it is observed that many countries put their struggles to conserve environment for the sake of socio-economy sustainability. They encouraged the adoption of GV among their people and government fleet inclusive of police cars, government’s cabinet transport, and vans for
tourists through incentives and policies, but they seem forgetting to overlook at logistics vehicles into account while their movements on road are increasing day by day due to tremendous demand of logistics services nowadays. This is especially true in pandemic Covid-19 that takes the world by storm and Malaysia not spared. In this sense, this study fills the gap by viewing the insight of logistics service providers (LSPs) in Malaysia on how government policies and incentives could work together to significantly contribute to sustainability of socio-environment. In logistics sector, the Malaysian government recently highlights its focus on sustainability issues, especially related to environmental protection [24]. The government acts to protect environment through sustainability and environmental policies, and encourage logistics players to take part in sustainability efforts by providing support through tax incentives and funds [25,26].

2.2 Socio-environment Sustainability
Socio-environment sustainability is a combination of social and environmental sustainability. In many cases environment and social sustainability are related with each other. Healthy environment leads to healthy social performance. Similarly, this paper discusses how government incentives and policies can help LSPs to provide services that do not contribute to the environmental pollution and GHG effects, which then lead to unhealthy social performance. Hence nowadays, LSPs are aimed for sustainability performance approach, concerning on the Triple Bottom Line elements; the environmental, social and economic performance [27], as a result of growing awareness of the unsustainability of logistics services which threaten the environment directly [28], social and economic performance indirectly [29]. However, only environmental and social sustainable performance is being concerned in this study.

LSPs which involve and concern in environmental activities will bring sustainable performance for both LSPs and Earth simultaneously; a balance win-win situation in terms of (i) saving Earth from climate change effect, (ii) healthy and harmony Earth for living creatures to live in, (iii) increase economic performance of LSPs and (iv) social welfare of employees are taken care of [30]. As an additional advantage, they will be much favorable among stakeholders and shareholders [31-33]. This becomes an extra motivation for LSPs to seriously take action regarding the adoption of GV in their delivery services.

According to literature, environmental sustainability means the effects of environmental footprint are relatively lesser than the capacity of the environment can accommodate. One of major contributors to the environmental sickness is transportation [34]. The transportation mainly contributes to negative effects through their ICE which produces (i) GHG emissions which contains CO2 and NO2 [34,35], (ii) other hydrocarbon particles [34] and (iii) noise, dust, water and ocean pollutions [34,36]. Meanwhile, social sustainability in the context of logistics and supply chains are (i) process or products which affect the safety and welfare of people [37], (ii) “the management of social issues such as equity, safety and health, product responsibility, human rights, and philanthropy throughout the supply chain” [38] and (iii) “the health and wellbeing of people in the supply chain and impact on society” [39]. Thus, it can be literally said that social sustainability is focusing on human right, safety and welfare.

In this sense, environmental sustainability comes from strong economic and monetary policies, together with environmental policy across transport, energy, trade and finance policy sectors [40] and social sustainability is facilitated by strong formal institutions which provide strong social policies [41]. Thus, Welter [42] concluded that social sustainability comprises of human, environment and economic well-being resulted from government policies, rules and regulations. Previously, most companies work for sustainability in order to obey law and regulations, as well as for the purpose of competitive advantage. But nowadays they concern on sustainability due to their consciousness of healthy environment, well-being of society and not forgotten to increase their value in global market [43], thus the companies develop sustainable business model which creates long term environmental, social and economic values [44].
3. Hypothesis Development and Conceptual Framework

Based on the literature review, four hypotheses were developed:

\( H1: \) LSPs strongly agreed they need financial and non-financial incentives in order to involve in adoption of green technology.

\( H2: \) LSPs strongly agreed that they need policies for sustainability in order to involve in adoption of green technology.

\( H3: \) Financial and non-financial incentives have a significant positive effect on the socio-environment sustainability of LSPs.

\( H4: \) Policies for sustainability have a significant positive effect on the socio-environment sustainability of LSPs.

Consequently, a conceptual framework was established. Figure 1 shows the conceptual framework.

![Conceptual Framework](image)

Figure 1: Conceptual Framework

4. Research Methodology

A total of 600 questionnaires were sent through e-mail to the 600 LSPs in Selangor, Johor and Penang which were registered under the Federation of Malaysia Freight Forwarders, listed in the Malaysia Logistics Directory 2018/2019 [45]. The questionnaires were directed to top management of companies, ranging from chief executive officer (CEO) to senior executive. A total of 134 returned questionnaires were usable, which is equal to 22.3% of response rate.

Section A of the questionnaire contains three items measuring policies of sustainability, Section B comprises four items which measure financial and non-financial incentives, Section C covers nine items about socio-environment sustainability of LSPs and last but not least Section D asked about demographic of company and the personnel who answered the questionnaire. Respondents were requested to answer on a 7-point Likert scale ranges from 1 (strongly disagree) to 7 (strongly agree). Table 1 below shows the sources of items adopted in this study.

Subsequently, the data were analyzed using IBM SPSS 25.0 statistical software. Further analysis comprised of descriptive and correlation analyses. According to Pallant [46], if the value of Pearson correlation coefficient, \( r \) is in the range of 0.1 - 0.29, the correlation is small; when \( r = 0.3 - 0.49 \), it is assumed that the relationship possesses a medium strength and when \( r = 0.50 - 1.0 \), the correlation is considered large, suggesting that the relationship of both observed variables is strong.
Table 1: Sources of Measurement

| Variable                          | No. of Item | Source                                                                 |
|-----------------------------------|-------------|------------------------------------------------------------------------|
| Policies for sustainability       | 3           | Wu, Ding, and Chen (2012), Ye, Zhao, Prahinski, and Li (2013) and Chu, Yang, Lee, and Park (2017). |
| Financial and non-financial incentives | 4           | J. Hong, Feng, Wu, and Wang (2016), Crago and Chernyakhovskiy (2017) and Etthe Raj (2019). |
| Socio-environment sustainability of LSPs | 9           | Paulraj (2011), Huo (2012) and Huo, Gu, and Wang (2019).               |

5. Results and Discussion

5.1 Demographic of Respondents

This section is divided into two subsections - profile of company and profile of respondent. The demographic information is important in order to recognize the characteristics of sample for this study. From 134 of respondents, Table 2 presents the findings of descriptive analysis on the personnel’s demographic who answered the questionnaire on behalf of each company.

From the descriptive analysis, Table 2 shows that majority personnel who answered the questionnaire have Bachelor degree as their highest education (41.8%), followed by Diploma (26.9%), Master degree (17.2%), SPM (9.7%), PhD/DBA (3.0%) and STPM (1.5%). In case of position in company, 49 out of 134 personnel were senior executive, representing 36.6% of the sample, 25 were managers (18.7%), 23 were senior managers (17.2%), 18 were managing directors (13.4%), 17 were general managers (12.7%) and two of them were CEOs (1.5%). In terms of personnel experience for working in current job and current organization, both show that almost 50% of them experienced more than 10 years of experience in logistics companies, covering the largest percentage of sample size, 43.3% and 37.3% respectively. Only small portion worked 1 year or less in the logistics companies; 9% worked 1 year or less in current job and 14.2% worked in current organization.

Table 2 presents the findings of demographic analysis for LSPs’. As for age of companies, majority of companies involved in this study (72.4%) established more than 10 years in the market. Only 6% established 2 years or less. 14.2% of respondent companies sustained in the market for three to six years and 7.5% already established since seven to ten years ago. In terms of company’s size, more than 50% were large companies (54.5%), 36.9% were small and medium size and only 8.2% of companies were categorized as micro.

In general, majority of the LSPs which involved in this study operated for more than 10 years, large and local companies. Almost all of them provided transportation service as their core logistics service (112 companies), followed by freight forwarding (98 companies), warehousing (93 companies), packaging (64 companies), inventory management (57 companies) and cross-docking (55 companies). The number of total services offered (based on types of services) reflects that those available services appeared manageable to cater the demand of logistics services in Malaysia. However, in the pandemic Covid-19 as a new norm, the LSPs increased their availability for transportation service due to sudden increment in the demand, as people mainly use digital platform to shop.
### Table 2: Descriptive Statistics for Demographic of Personnel

| Background Information | N (t=134) | Percentage (%) |
|------------------------|-----------|----------------|
| Personnel Highest Educational Qualification |   |   |
| SPM                    | 13        | 9.7            |
| STPM                   | 2         | 1.5            |
| Diploma                | 36        | 26.9           |
| Bachelor Degree        | 56        | 41.8           |
| Master Degree          | 23        | 17.2           |
| Ph.D./DBA              | 4         | 3.0            |
| Current position in your organization |   |   |
| Senior Executive Manager | 49   | 36.6           |
| Senior Manager         | 25        | 18.7           |
| General Manager        | 23        | 17.2           |
| Managing Director      | 17        | 12.7           |
| Chief Executive Officer (CEO) | 2 | 1.5     |
| Years in current job   |   |   |
| 1 year or less         | 12        | 9.0            |
| 2 - 5 years            | 42        | 31.3           |
| 6 - 10 years           | 22        | 16.4           |
| More than 10 years     | 58        | 43.3           |
| Years of working at the organization |   |   |
| 1 year or less         | 19        | 14.2           |
| 2 - 5 years            | 42        | 31.3           |
| 6 - 10 years           | 23        | 17.2           |
| More than 10 years     | 50        | 37.3           |

5.2 Financial and Non-financial Incentives

Table 3 shows the results for descriptive analysis on the financial and non-financial incentives provided by the government. There were four items in this variable, asking the respondents on the importance of financial and non-financial incentives to their companies. The first item ‘Tax incentives pertaining to sustainability are important financial based incentives’ obtained mean of 6.045. The second item ‘Price subsidy for sustainable-related equipment is important financial based incentives’ attained mean value of 6.022. The mean value for the third item ‘Grants is important financial based incentives’ was 5.828 and the last item ‘Non-financial incentives are equally important’ had mean of 5.918.

### Table 3: Descriptive Analysis for Financial and Non-financial Incentives

| Item                                                                 | N  | Minimum | Maximum | Mean   | Standard Deviation |
|-----------------------------------------------------------------------|----|---------|---------|-------|-------------------|
| Tax incentives pertaining to sustainability are important financial based incentives | 134 | 2.00    | 7.00    | 6.045 | 1.054             |
| Price subsidy for sustainable-related equipment is important financial based incentives | 134 | 2.00    | 7.00    | 6.022 | 1.015             |
| Grants are important financial based incentives                        | 134 | 1.00    | 7.00    | 5.828 | 1.211             |
| Non-financial incentives are equally important                          | 134 | 2.00    | 7.00    | 5.918 | 1.069             |
With average mean of the four items were 5.953 (close to 6.000), these findings indicate that the LSPs mostly agreed on tax and price subsidies were important as their companies’ financial incentives. Furthermore, the LSPs also found that grants were important for financial incentives and non-financial incentives were equally important for them in order to adopt sustainable technology including GV. Green technology especially for vehicles are price sensitive, thus they cannot stand alone without supports from the government. These findings supported by studies elsewhere by Malik et al. [12], Axsen et al. [18] and Holtsmark and Skonhoft [19] who concluded that people need government supports like tax incentives, price subsidy, energy subsidy, parking subsidy and related infrastructure to help them with the implementation of sustainability technology, focusing of green vehicles. These supports can be categorized into financial and non-financial incentives from the government. Hence, H1 is supported by this study.

5.3 Policies for Sustainability

Table 4 demonstrates the results for descriptive analysis pertaining to the second variable - policies for sustainability. This variable was established in this study purposely to investigate the view of LSPs on the importance of government policies on the sustainability upon their companies. Mean values for items ‘Environmental protection policies and society's rights protection force our company to exercise environmental protection’ was 6.127, ‘Encourages our environmental management in our company’ obtained 6.030 and ‘Potential conflicts between our services and policies affect company's environmental management’ attained 5.900.

Similar to financial and non-financial incentives, these findings explained that the LSPs mostly agreed (average mean of 6.019) that environmental policies are important for their companies to practice environmental protection. This is because environmental policies seem to motivate their companies to apply sustainability efforts. Opposing the government policies on sustainability will cause conflict thus affecting their environmental management. After all, the findings are supported by aforementioned studies by Malik et al. [12] and Tshering [20]. They found that the government of India and Bhutan respectively developed an important policy regarding this issue in the effort to reduce GHG emission. Furthermore, Adnan et al. [23] also found that the Malaysian government has slowly developed several policies to reduce the price of GV to encourage people to buy GV in that country. Thus, H2 is supported.

| Table 4: Descriptive Analysis for Policies for Sustainability |
|-------------------------------------------------------------|
| Item                                                                 |
| Environmental protection policies and society's rights protection force our company to exercise environmental protection | 134 | 1.00 | 7.00 | 6.127 | 1.086 |
| Encourages our environmental management in our company           | 134 | 1.00 | 7.00 | 6.030 | 1.047 |
| Potential conflicts between our services and policies affect company's environmental management | 134 | 1.00 | 7.00 | 5.900 | 1.146 |
5.4 The Effects of Financial and Non-financial Incentives, and Policies of Sustainability on Socio-economic Sustainability of LSPs

This study examines the relationship between financial and non-financial incentives and socio-economic sustainability of LSPs by adopting Pearson correlation analysis. Table 5 displays the result for this relationship. From the Table 5, the result shows that the Pearson correlation coefficient, \( r = 0.631 \) and significant at \( p = 0.01 \), indicating that financial and non-financial incentives have a strong significant positive effect on the socio-economic sustainability of LSPs. Therefore, H3 is supported.

|       | FNI       | SES       |
|-------|-----------|-----------|
| FNI   | Pearson Correlation | 1         | .631**    |
|       | Sig. (1-tailed)   |          | .000      |
|       | N           | 134       | 134       |
| SES   | Pearson Correlation | .631**    | 1         |
|       | Sig. (1-tailed)   | .000      |           |
|       | N           | 134       | 134       |

***. Correlation is significant at the 0.01 level (1-tailed).
FNI–Financial and non-financial incentives, SES–Socio-environment sustainability

Table 6 presents the results of correlation analysis for the relationship between policies for sustainability and socio-environment sustainability. Based on the results, the Pearson correlation coefficient, \( r = 0.763 \) with significant \( p = 0.01 \), demonstrating that financial and non-financial incentives have a strong significant positive effect on the socio-economic sustainability of LSPs. Then, H4 is found supported by this study.

|       | PS       | SES       |
|-------|----------|-----------|
| PS    | Pearson Correlation | 1         | .763**    |
|       | Sig. (1-tailed)   |          | .000      |
|       | N           | 134       | 134       |
| SES   | Pearson Correlation | .763**    | 1         |
|       | Sig. (1-tailed)   | .000      |           |
|       | N           | 134       | 134       |

***. Correlation is significant at the 0.01 level (1-tailed).
PS – Policies for sustainability, SES – Socio-environment sustainability

The findings of correlation analysis for both relationships suggest that financial and non-financial incentives, as well as policies for sustainability strongly affect the socio-economic sustainability of LSPs in Malaysia. According to respondents, with the supports from the government in terms of tax incentives, price subsidy, grants and non-financial incentives for instance were all important for them to involve in sustainability efforts. Among these four items, the respondents seem to favour tax incentives and price subsidy a little more compared to grants and non-financial incentives. They might assume that tax incentives and price subsidy give extra freedom for them to make choices. Subsidize of grants normally tie with certain contract that they in return should fulfil. This seems to give a slight pressure for them. Meanwhile, non-financial incentives were equally important for them, especially when they come to related equipment that the LSPs could not afford to provide or service subsidy that can help reducing their operational cost such as routine maintenance. These kinds of incentives spark robust motivation
for LSPs to invest in the change of their ICE type vehicles to the environment-friendly type of vehicles. This is so called ‘cure from the root’.

Furthermore, the findings also reveal that LSPs need ‘a soft force’ from the government, which are policies for sustainability. From their views, the policies regarding sustainability like environmental and social protection policies forced and pushed their companies to pay attention and take appropriate actions to exercise sustainable logistics operations as well as encourage the companies to have a proper environmental management. With the availability of these policies, the LSPs are enforced to follow in order to prevent potential unwanted conflicts happened between their companies and authorities. Conflicts will affect their business operations and damage their reputations in the market.

Henceforth, when the two influential factors are fulfilled, the socio-environment sustainability is obtained for both LSPs and society. LSPs which use GV in their delivery services will significantly cut the volume of CO2 and NO2 discharges to the air, thus reducing the GHG emissions. In other words, environment-friendly vehicles actually decrease the consumption of harmful and toxic materials, gasoline and diesel. Additionally, LSPs use many trucks for the delivery process and the trucks operated based on diesel fuel. Unfortunately, diesel produces 13% more CO2 in 1 litre diesel compared to gasoline [47] and 60% of NO2, compared to 0-30% in gasoline [48]. Therefore, it is very much significant for the government to develop sustainability policies and provide suitable incentives to encourage LSPs transform their vehicles from ICE to the GV. Consequently, it will reduce environmental impacts and lessen risks on the society. It goes without saying that societies who live in clean environment is healthier and safer, especially for the most vulnerable to environmental pollution - old folks and kids. Particles in exhaust emissions might critically harm respiratory system. Therefore, their welfare is more assured.

The positive effects due to the transformation of logistics vehicles’ engines towards the environment and society contribute significantly to the SDGs. In order to achieve it, green logistics sector fulfils five out 17 pillars which are Goal 3 – “Ensure healthy lives and promote well-being at all ages”, Goal 8 – “Promote sustainable economic growth, full and productive employment, as well as decent work for all”, Goal 9 – “Build resilient infrastructure, promote sustainable industrialization and foster innovation”, Goal 11 – “Make cities and human settlement safe, resilient and sustainable” and Goal 17 – “Strengthen the means of implementation and revitalize the global partnership for sustainable development” [49].

6. Research Implication
Based on the findings, this study implies that LSPs need government supports to become environmentally friendly and consequently supporting SDGs. The government should take immediate action on this issue because transforming vehicles from ICE to GV is an effective way to help reducing the level of environmental pollution and GHG emission. For example, a research from Stanford University, East Anglia University, Exeter University and the Global Carbon Project found that the movement restriction during Covid-19 pandemic has caused CO2 emissions due to combustion of fossil in ICE vehicle declined by approximately 2.4 billion tonnes in 2020. It was a world record since the past century. Year 1981 and 2009 recorded 0.5 million tons decreased of CO2 (GtCO2), 1992 with decrement 0.7 of GtCO2 and 0.9 GtCO2 at the end of the World War II in 1945. The reduction of 2.4 billion tons emissions seems to equivalent of taking 500 million cars off from the world’s roads in that year. Inferring the emissions from transports are the greatest contributions to the global environmental quality degradation. [50].

LSPs could not afford to stand alone, hence, without supports from government, this mission is seen as implicit, and hence they must work hand in hand with the government. Their cooperation in this matter promises a healthy environment and society. Moreover, it becomes a competitive advantage in the market by means of stakeholders around the world also now aware about the sustainability of the world as a whole. They tend to choose companies who care about environment and society. This helps LSPs in terms of sustainable economic performance as well.
7. Conclusion
In conclusion, this study reveals the insights of LSPs pertaining the importance of policies for sustainability and financial and non-financial incentives from the government to help them adopting green type of vehicles as a substitution to vehicles with ICE in order to achieve socio-environment sustainability. The gathered data from 134 LSPs in Klang, Johor and Penang were analysed in IBM SPSS 25.0 statistical software. Based on the results of descriptive analysis, LSPs were strongly agreed that government supports like policies for sustainability and financial and non-financial incentives were vital for them to implement sustainable technology in their vehicles as the GV are price sensitive. Moreover, the correlation analysis exposed those policies for sustainability and financial and non-financial incentives had significant positive relationships with socio-environment sustainability of LSPs. Therefore, all four developed hypotheses were supported.

However, this study is not without limitation. The data collection process happened during the total lockdown due to Covid-19 pandemic in Malaysia, thus only 134 samples were successfully collected. It is suggested that future research could consider a bigger sample size and to take a deep-dive into specific incentives required by LSPs in Malaysia to contribute to social-environmental sustainability.

Acknowledgement
This research is funded by Ministry Higher Education (Malaysia), under Fundamental Research Grant Scheme (FRGS), grant number R/FRGS/A1100/01670A/001/2018/00547.

References
[1] Orim, Ruby. 2020. "Indonesia Has Seen a Whopping 313% Increase in Greenhouse Gas Emissions Since 1990." Climate Scorecard Accessed 14th April 2021. https://www.climatescorecard.org/2020/12/indonesia-has-seen-a-whopping-313-increase-in-greenhouse-gas-emissions-since-1990/.
[2] Worldometer. 2020. "Indonesia Population (LIVE)." Worldometer Accessed 14th of April, 2021. https://www.worldometers.info/world-population/indonesia-population/.
[3] Tempo.co. 2020. "Jakarta Ranks 10th on World's Most Congested Cities List ". Tempo.co Accessed 14th of April, 2021. https://en.tempo.co/read/1303052/jakarta-ranks-10th-on-worlds-most-congested-cities-list.
[4] UNDP. 2021. "Sustainable Development Goals." United Nations Accessed 21th of April, 2021. https://www.undp.org/content/undp/en/home/sustainable-development-goals.html.
[5] Energy.gov. 2013. "Internal Combustion Engine Basics ". U.S Department of Energy Accessed 14th of April, 2021. https://www.energy.gov/eere/vehicles/articles/internal-combustion-engine-basics.
[6] Erdoğan, Sevgi, and Elise Miller-Hooks. 2012. "A green vehicle routing problem." Transportation research part E: logistics and transportation review 48 (1):100-114.
[7] Mom, Gijis. 2013. The electric vehicle: Technology and expectations in the automobile age: JHU Press.
[8] United States Environmental Protection Agency. 2019. "Learn About Green Vehicles - What Makes a Vehicle Green?". United States Environmental Protection Agency Accessed 10 June 2021 https://www.epa.gov/greenvehicles/learn-about-green-vehicles.
[9] Union of Concerned Scientists. 2015. "How Do Battery Electric Cars Work?". Union of Concerned Scientists Accessed 15th of April. https://www.ucsusa.org/resources/how-do-battery-electric-cars-work.
[10] World Bank Group. 2020. The Impact of COVID-19 on Logistics. International Finance Corporation.
[11] Ames, Ben. 2020. "Covid-19 shortages: brokers shift trucking capacity to “essential” sectors." ePublishing Accessed 11 March 2021. https://www.develocity.com/articles/45546-covid-19-shortages-brokers-shift-trucking-capacity-to-essential-sectors.
[12] Malik, Yashpal, Nirupama Prakash, and Ajay Kapoor. 2018. "Green Transport: A Way Forward for Environmental Sustainability." In Environment, Politics, and Society. Emerald Publishing Limited.

[13] Gallagher, Kelly Sims, and Erich Muehlegger. 2011. "Giving green to get green? Incentives and consumer adoption of hybrid vehicle technology." Journal of Environmental Economics and management 61 (1):1-15.

[14] Gong, Shuangqing, Ali Ardeshiri, and Taha Hossein Rashidi. 2020. "Impact of government incentives on the market penetration of electric vehicles in Australia." Transportation Research Part D: Transport and Environment 83:102353.

[15] Egube, Ona, and Suzanna Long. 2012. "Barriers to widespread adoption of electric vehicles: An analysis of consumer attitudes and perceptions." Energy policy 48:717-729.

[16] Lévay, Petra Zsuzsa, Yannis Drossinos, and Christian Thiel. 2017. "The effect of fiscal incentives on market penetration of electric vehicles: A pairwise comparison of total cost of ownership." Energy Policy 105:524-533.

[17] Matteson, Schuyler, and Eric Williams. 2015. "Learning dependent subsidies for lithium-ion electric vehicle batteries." Technological Forecasting and Social Change 92:322-331.

[18] Axsen, John, Joseph Bailey, and Marisol Andrea Castro. 2015. "Preference and lifestyle heterogeneity among potential plug-in electric vehicle buyers." Energy Economics 50:190-201.

[19] Holtsmark, Bjart, and Anders Skonhoft. 2014. "The Norwegian support and subsidy policy of electric cars. Should it be adopted by other countries?" Environmental science & policy 42:160-168.

[20] Tshering, L. 2014. "Bhutan electric vehicle initiative: A step towards zero emission.". United Nations Accessed 15th of April. http://www.unccd.or.jp/content/documents/22548EST-P2_Bhutan.pdf.

[21] Sundas, S.. 2015. "On the road to zero emissions, Bhutan hits a few electric car bumps." Accessed 15th of April 2021. http://www.reuters.com/article/2015/06/09/us-bhutan-climate-change-autosales-idUSKBN0OP0 W720150609.

[22] Hong, Yong Hoe, Nasreen Khan, and Muhammad Madi Abdullah. 2013. "The determinants of hybrid vehicle adoption: Malaysia perspective." Australian Journal of Basic and Applied Sciences 7 (8):347-454.

[23] Adnan, Nadia, Shahrina Md Nordin, and Imran Rahman. 2017. "Adoption of PHEV/EV in Malaysia: A critical review on predicting consumer behaviour." Renewable and Sustainable Energy Reviews 72:849-862.

[24] Maheswari, Hesti, Gatot Yudoko, and Akbar Adhiutama. 2018. "Theory building of quattro bottom line approach for sustainable reverse logistics from government perspective: The Indonesia evidence." Advance in Science, Technology and Engineering Systems Journal 3 (3):83-98.

[25] Cohen, Steven. 2014. "The Role of Government in the Transition to a Sustainable Economy." Huffpost Accessed 30 May 2021. https://www.huffpost.com/entry/the-role-of-government-in_b_4759621.

[26] MIDA. 2019. "Incentives in Services Sector." Accessed 16th of April, 2021. http://www.mida.gov.my/home/incentives-in-services-sector/posts/.

[27] Elkington, John. 2013. "Enter the triple bottom line." In The triple bottom line, 23-38. Routledge.

[28] Peterlin, Judita, Noel J Pearse, and Vlado Dimovski. 2015. "Strategic decision making for organizational sustainability: The implications of servant leadership and sustainable leadership approaches." Economic & Business Review 17 (3).

[29] Markman, Gideon D, and Daniel Krause. 2016. "Theory building surrounding sustainable supply chain management: Assessing what we know, exploring where to go." Journal of supply chain management 52 (2):3-10.

[30] Macharis, Cathly, Sandra Melo, Johan Woxenius, and Tom Van Lier. 2014. Sustainable logistics: Emerald Group Publishing.
[31] Byrne, PJ, Paul Ryan, and Cathal Heavey. 2013. "Sustainable logistics: a literature review and exploratory study of Irish based manufacturing organizations." International Journal of Engineering and Technology Innovation 3 (3):200-213.
[32] Werbach, Adam. 2009. Strategy for sustainability: A business manifesto: Harvard Business Press.
[33] Wolf, Christina, and Stefan Seuring. 2010. "Environmental impacts as buying criteria for third party logistical services." International Journal of Physical Distribution & Logistics Management 40 (1/2):84-102.
[34] Mosaberpanah, M.A., and S. Darban Khales. 2012. "The Role of Transportation in Sustainable Development." International Conference on Sustainable Design, Engineering, and Construction 2012, Fort Worth, Texas.
[35] United States Environmental Protection Agency. 2017. "Overview of Greenhouse Gasses." Accessed February, 5th, 2021. https://www.epa.gov/ghgemissions/overview-greenhouse-gasses.
[36] McKinnon, Alan, Arni Halldorsson, and Christophe Rizet. 2014. Theme issue on sustainable freight transport. Elsevier.
[37] Wood, D.J. 1991. "Corporate social performance revisited." Academy of Management Review 16 (4):691–718.
[38] Mani, Venkatesh, Angappa Gunasekaran, and Catarina Delgado. 2018. "Enhancing supply chain performance through supplier social sustainability: An emerging economy perspective." 195:259-272.
[39] Pulis, A., and S. Dovers. 2006. "Environment and Sustainability Policy — Creation, Implementation, Evaluation." Journal of Environmental Assessment Policy and Management 8 (3):403-406.
[40] McCall, L., and C. Percheski. 2010. "Income inequality: New trends and research directions." Annual Review of Sociology 36:329-347.
[41] McCall, L., and C. Percheski. 2010. "Income inequality: New trends and research directions." Annual Review of Sociology 36:329-347.
[42] Welter, Friederike. 2011. "Contextualizing entrepreneurship—conceptual challenges and ways forward." Entrepreneurship theory and Practice 35 (1):165-184.
[43] Agrawal, Saurabh, Rajesh Kr Singh, and Qasim Murtaza. 2016. "Triple bottom line performance evaluation of reverse logistics." Competitiveness Review 26 (3):289-310.
[44] Wales, Terry. 2013. "Organizational sustainability: what is it, and why does it matter?" Review of Enterprise and Management Studies 1 (1):38-49.
[45] Malaysia Logistics Directory. 2018/2019. Malaysia Logistics Directory. Malaysia: Marshall Cavendish Business Information.
[46] Pallant, Julie. 2020. SPSS survival manual: A step by step guide to data analysis using IBM SPSS: Routledge.
[47] The International Council on Clean Transportation. 2019. Gasoline vs diesel. Comparing CO2 emission level of a modern medium size car model under laboratory and on-road testing conditions. Accessed 18th of April 2021.
[48] The Transport and Environment. 2015. Five facts about diesel the car industry would rather not tell you. Accessed 18th of April 2021.
[49] United Nations. 2015. "Sustainable Development Goals." Accessed February, 6th 2021. http://www.un.org/sustainabledevelopment/sustainable-development-goals/.
[50] Stanford Earth. 2020. "COVID lockdown causes record drop in carbon emissions for 2020 ". Stanford University Accessed 21th of April 2021. https://earth.stanford.edu/news/covid-lockdown-causes-record-drop-carbon-emissions-2020#gs.zc2rat.