**Introduction**

With the success of the Tesla electric cars, the engineering industry shifted its focus from reducing vehicles fuel consumption to developing the electric vehicles. Electric vehicles (EVs) have been discovered as high potential solution to resolve the problems of high greenhouse gas emission contributing to climate change (IEA, 2022). Nevertheless, the potential of paving the way to a greener future is limited by the factors regarding to the production, disposal, and recycling of essential EVs component, lithium-ion batteries. This essay is concentrated on analysing the implications of EVs to the sustainability issue from professional, economic, environmental, health and safety, as well as legal perspectives.

**Definition of Greener Future**

With a view to facilitating the readability of this essay, the definition of some key words must be illustrated, especially greener future. Referring to journal written by Langston in 2021, greener future is building a sustainable environment without bringing any over consumption of natural resources. Meanwhile, there are various contributing factors to achieve sustainability leading to greener future, including decrease of greenhouse gas emissions, appropriate energy consumption, biodiversity conservation, and pollution reduction.

**Professional Perspective**

To commence with, the professionalism should be demonstrated through a well-organized product life cycle in the existing industry. Nowadays, engineers promote battery recycling to reduce the number of the disposal in the landfill. According to a study by Liu et al. (2019), they found that the battery can be designed to be easily disassembled and recycled via the existing technology. This reflects that the engineers and the scientists in the related industry are putting great effort into developing an easily recyclable battery. Recyclable battery facilitates resource management and waste reduction since the materials can be recovered. Eventually, the engineers are contributing to a greener future by redesigning the battery.

Nevertheless, the operation of the raw material suppliers may not be regulated and monitored under the professional supervisor. The manufacturing process of an EV adopts territorial division of labour (Charette, 2023). This indicates that the raw material mineral companies are not under the control of EV industry. Some of the mineral companies may want to maximize the profit via illegal and cruel methods. As a result, child employment and employees exploiting occur. Therefore, the EVs industry should reinforce the investigation on the background of the raw material suppliers to fulfil the social responsibility.

**Economic Perspective**

Besides, the EVs’ assists the society to maintain the employment rate. With the expansion of EVs market, the EVs companies provides more position for the general public. According to European Association of Automotive Suppliers (2021), the growth in electric vehicles industries has resulted in an increase in specialized professions in areas including electric powertrain design, renewable energy integration, charging infrastructure development, and battery technology. As of 2019, around 41 million workers were employed by the energy sector in 2019. Among those 41 million workers, there are 24 million workers were employed by the end uses industry including vehicle manufacturing and efficiency (IEA, 2019). This reflects that the EVs industry contribute to maintain a stable economic environment by securing the sustainable economic development. Eventually, the EV industry facilitates the economic growth of the society.

Moreover, the price drop of EVs motivate people to purchase EV which stimulate the growth of EVs market. With dramatically demand on EVs market, the EV companies are willing to put more capital on the investment and innovation in the automotive and energy sectors. As a result, the price of the EV decreases to the level of gasoline vehicles. According to BloombergNEF (2022), the cost of manufacturing an EV battery has already dropped 90% from 2010 to 2024. This indicates that the EVs are expected to reach price parity with traditional gasoline vehicles. There will be more citizens willing to purchase the EV and leads to an economic cycle. Eventually, the EVs market achieve stability which protects the welfares and the livelihood of the employees.

**Environmental Perspective**

Apart from that, the EVs reduces greenhouse gas emissions and local air pollution when powered by clean energy sources. According to the IEA (2022), EVs could reduce 1.5 gigatons per year carbon dioxide emissions globally by 2030. Also, European Environments Agency (2023) claimed that the EVs is capable to reduce approximately 73% of the greenhouse gas emission by 2050. These two studies reflect that the EVs can effectively reduce the greenhouse gas emissions in urban areas. Eventually, EV can directly facilitate the countries worldwide to resolve the climate change.

However, the production of lithium-ion battery brings environmental disasters. Cobalt mining in the Democratic Republic of the Congo (DRC) contributes over two-thirds of the world’s cobalt. The cobalt mining in DRC has raised concerns about deforestation, habitat destruction, and water pollution (Hilson et al., 2020). Furthermore, the disposal of lithium-ion battery batteries rises a risk of soil and water pollution from heavy metals and other hazardous substances if the batteries are not properly managed (Zeng et al., 2019). Yet, this is a regional environmental problem which can be solved via advanced technologies.

**Health and Safety Perspective**

Furthermore, EVs can reduce respiratory illnesses associated with vehicle emissions in the urban area. EVs produce zero tailpipe emissions, which can help reduce air pollution and improve air quality. Studies have shown that the use of EVs can lead to significant reductions in air pollution and associated health benefits. For example, a study conducted in California found that widespread adoption of EVs could reduce air pollution-related deaths by up to 70% by 2050 (Jerrett et al., 2013). Another study conducted in the United Kingdom found that a switch to EVs could lead to a 30% reduction in premature deaths related to air pollution (Kelly et al., 2018). Eventually, this reflects that EVs directly helps the citizens improve health issue.

However, the raw material extraction process of the EV battery creates health and safety issue towards the local society. The local children are employed by the mineral companies. According to Amnesty International (2016), the involvement of 40,000 Congolese children in cobalt mining every day. This makes the children place in the hazardous working conditions, and physical abuse. The child employment severely impacts the personal growth of the children involved. In addition, cobalt mining leads to numerous health issues, especially respiratory issuesq, musculoskeletal disorders, and exposure to radiation. Additionally, the recycling of lithium-ion batteries involves risks related to toxic fumes and chemical exposure, necessitating strict safety protocols and effective waste management practices (Zhang et al., 2018). Therefore, the EVs development may affect the workers’ health issue.

**Legal Perspective**

To tackle the legal problem associated with EVs, engineers, the companies, and the governments must put great effort into developing a comprehensive legal system that reinforce human rights, motivate reasonable sourcing, and protect the environment. The European Union (EU) has developed the Battery Regulation via creating several standards for the sustainable production, use, and disposal of lithium-ion battery (European Commission, 2020). This law is concentrated on reducing the environmental impact of batteries by setting requirements for sourcing and recycling (European Commission, 2020). On the other hand, the United States has released the Dodd-Frank Wall Street Reform and Consumer Protection Act. These laws require battery production companies to give public access to the use of conflict minerals, including cobalt, in the battery product (U.S. Securities and Exchange Commission, 2012). These legal systems can help ensure sustainable development in the EV industry.

**Conclusion**

Electric vehicles are contributing to a greener future, however the drawbacks of EVs across multiple dimensions must be taken into account when discussing the EVs. While EVs bring environmental, economic, and professional benefits to the public, the EVs pose obvious health, safety, and legal challenges that require proactive measures from different stakeholders. By solving these issues and provoking sustainable development of EV production, the electric vehicles can become a short cut for the society to achieve a greener future.

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