ENG 3004 Society and the Engineer

Assignment 2 – Question 2

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**Abstract**

Electric vehicles (EVs) are new type of vehicles that powered by electricity. The production of it brought a lot of benefits to the world and thus being repected. However, on the other side, there are hidden details about the EVs are less obvious to puclic. Those effects bought different impacts in different apspects. Eventually, whether the EVs will leads human to bright future is still questionable.

**Professional**

The basic definition of professional lies in the proficiency of one’s occupation. People who have a specific field of knowledge to work on, are professionals. The electric vehicle is a top-tier technological product in modern society for future development. Undoubtedly, corporate which manufacture EVs is certainly professional. Except for the ability to create EVs, the obligation to conduct ethical actions is more important. From a moral point of view, whether the development of EVs carries social responsibility is questionable.

The development of EVs contributes positively to a more developed country. EVs emit almost no pollution during their operation (Energy, 2016). If fossil fuel cars are completely replaced by EVs, the city's air pollution problem would be alleviated. It contributes to the modern city by enhancing the living quality. It is a morally praised goal in terms of the principle of beneficence. EV ought to remove harmful substances and phenomena that exist in human society, This shall be reckoned as professional behaviour.

Common EVs require li-ion batteries which are made of cobalt. The major supplier of cobalt is Congo. Researchers reveal that the mining of cobalt in congo may include child labour (Affairs, 2021). If the EV company acknowledge and accept the use of cobalt which originated from the child labour production line, it should be considered a violation of some principles of ethic. Children in cobalt mines suffer from a lot of harm from the environment and work properties. The working environment brought potential harm and risks to workers. This includes toxic air pollutants leading to respiratory systems diseases or even cancers. The dangerous working site also causes physical harm like falling rock fragments and explosives. Obviously, a violation of the principle of nonmaleficence occurred when the job is inflicting harm on the children.

The EV company will also violate the principle of honesty under certain circumstances. In a situation where the EV company sources the cobalt from an unethical source and intentionally hides the truth from the consumer. This action conceals important information internally. Affect consumers who are concerned about the wellness of workers. In conclusion, whether the EVs development is professional enough is absolutely depending on how the company approaches the production process.

**Economic**

The EV brought important economic impact globally. From a macro point of view, the development of EVs may boost economic growth, especially for less developed countries where the raw materials came from (Stuttaford, 2023). This effect is especially prominent in the cobalt mining region. Despite the problem of child labour, the demand for cobalt is rising. The need for miners to extract rare metals will increase. A huge amount of job opportunities will be created for raw material suppliers. It gave the chance for people in less developed countries to gain income and enhances the economic growth within the country.

A structural change will affect the worldwide energy supply chain. As EVs production is becoming popular in the world, the need for fossil fuels from fossil cars will decrease sharply. Electric power as a substitute will become a demanding good. Based on the demand and supply curve, the price of fossil fuel will drop while electric power will rise. The fossil fuel holder and fossil production chain will receive capital lost (Amelang, 2021). Instead, the profit of electricity generation companies will rise. The flow of capital in the world will be changed and the supply chain shifted.

From a micro point of view, car users will enjoy a profit no matter whether they are EV users or traditional fossil fuel car users. For EV users, the government will provide incentives for new EV buyers such as lower registration tax. For fossil fuel car users, as the fuel price drops the cost of driving fossil fuel cars will also drop. To small individuals in the city, the development EV will only create economic benefits for them.

**Environmental**

EV contributes differently to the environment in different stages of its life cycle. Arguably, the development of EVs will be sustainable under certain assumptions.

In the production stage, EVs bring negative effects on the environment. The raw materials are extracted from nature. This consumption of resources limited the resources for the future generation. Mining activities take place in natural habitats to acquire rare metals. The mining work will increase as a car battery is made out of plenty of cobalt. Opening new mines could not avoid large-scale deforestation and terrain removal (KAYE, 2012). It will damage the natural habitat for wild animals as well as alter the energy cycle in that region. The pollution made while extracting resources from nature is uncountable. To the environment, the production stage is the most devastating process in EV development.

For EVs to replace fossil fuel cars in society, they offer an environmental friendly way for people to commute in the city. Since EVs use electricity to power the actuation system. It will not emit any air pollutants like fossil fuel cars. The only substances that EVs will create was heat energy and noise. They were insignificant when compared to the pollution bought by traditional fossil fuel cars. From another perspective regarding the generation of electricity, it might not be the same case. If the electricity came from a power plant that burns coal and gas, it would not be much different to burning fuel in the car engine. From this concern, the electricity shall be generated by clean and renewable power (Energy A. R., 2021). Making use of solar power, wind power, hydropower and thermal power would lead to much cleaner use of EVs.

When EVs reach the end of their life cycle, people will need to handle the unwanted EV’s remains. There are mainly two methods to handle the remains. First, disposal to landfill. This method will only create land pollution and increase the burden of the landfill. Recycling is another way out that is more responsible for the environment. However, recycling heavy metals and batteries may induce other environmental risks. Improper recycling methods such as high-temperature melting and force dismantling produce toxic gases and toxic water. When releasing them to nature, it will create a second round of pollution.

**Health and Safety**

The safety issues of EVs have always been a concern to society. There are already few records about the issue of newly developed EV batteries (wile, 2023). Whether the EV is more reliable than the traditional fossil fuel car is still a hypothesis that needs to be investigated. A common accident with EVs is the battery self-ignition. Battery fire will lead to an explosion that will harm the users. Currently, there are limited standards that govern the safety of EVs. Administrative control shall be adopted. Related authorities and governments should constantly renew their regulations towards new technologies. Setting up new testing methods could ensure the car battery complies with the standards. It protects the welfare of the users. Reducing the risk of driving EVs.

The hidden health and safety issues of producing EVs brought attention to the public. Especially in the raw material extraction stage (Prevention, 2019). Few reports show that the cobalt mining business bought serve health damage to workers. Improper mining method uses cheap labour without providing them with suitable personal protective equipment. Suitable personal protective equipment could greatly reduce the risk of injury at work. For fallen debris hazards, a safety helmet could protect them from blunt debris. Air-filtering respiration masks could save them from inhaling toxic gases. Healthy labour could not only save the company from paying medical fee but also enhances their productivity.

**Legal**

There are some common legal problems in this topic. The most well-known one is the patency of the EV battery technology. Since EVs are getting more popular globally, more companies are trying to develop their self-designed battery technology to power their vehicles (Chant, 2011). It comes to a debate whether the self-claimed independent developed battery is true. Even reports are revealing that some of the technology was stolen from other manufacturers. Emphasizing this issue, stealing corporate’s confidential information is illegal. The guilty company will be punished by law. It could be a fine or even jail. Assuming a company is not stealing technology but trying to duplicate the same techniques. It has the risk of being accused of patent infringement. How to produce EVs without the same technology has become a trouble for most automobile manufacturers. To avoid violation of the law, some chose to develop new types of batteries with huge investments.

Most of the action is not illegal but immoral. In the case of using the child labour production line, companies always claim to be non-negligence. The EVs manufacturer contract out the raw material processing work to the sub-contractor. The sub-contactor then acquires raw materials for their sub-contactor. Therefore, even if the EV company uses an unethical source of raw materials, it can still claim to be innocent as the semi-product is provided by it sub contactor. Therefore, EV company should ensure that they source the raw material from an ethical approach, not obeying the law but obeying ethical rules.

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