U.S. Transportation Reform: The Shift Toward Alternative Energy

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Abstract

The need for transportation and energy consumption in the United States is growing with every day, along with the need for cheaper, and more sustainable energy sources.

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In the United States energy and fossil fuel consumption is at an all-time high, and transportation is in desperate need of reform. Car manufacturers, the EPA, and environmentalists are pushing the development of Hybrid Electric Vehicles (HEV), Zero Emission Vehicles (ZEV), and Electric Vehicles (EV) in hopes reducing the production of Greenhouse Gasses (GHG). While vehicles such as these produce significantly fewer pollutants, they are responsible for a substantial amount of the GHG produced in the United States through their manufacturing and delivery. Besides indirect pollution, these vehicles also come with a higher manufacturer's suggested retail price (MSRP), and require infrastructure development. Stakeholders are also concerned that these vehicles could affect the petroleum industry and alter the driving experience for car enthusiasts. Because of these factors, modern businesses and consumers face a dilemma in which they are forced to decide between helping promote a clean transportation, and opting for cheaper and more reliable gasoline powered vehicles which have been used for years.

Car manufacturers are the primary stakeholders in the research and development of HEVs and EVs, considering that they are responsible for most of the time and money invested in research and development. Considering that EVs, HEVs, and Hydrogen Fuel Cell Vehicles (HFCV), are powered by newer, and more advanced power plants, car manufacturers are forced to invest in new technologies and manufacturing techniques in order to produce these vehicles,

which will cost more money. Also, HFCVs and EVs will require infrastructure development through charge points, as well as hydrogen plants, which are the equivalent of gas stations. Creating infrastructure for these alternative vehicles comes with a substantial cost. According to the U.S. Department of Energy, building just one commercial charging facility with ten charging ports would cost about $19,000 (Morrow et al., 2008, p.32). These facts coupled with the fact that the vast majority of vehicles on the road are powered by gasoline, lead to higher costs for the manufacturers and the U.S. Government, costs which are then imposed on the consumers, by raising the MSRP on alternative vehicles, and various taxes. Even though the vehicles themselves produce insignificant amounts of pollutants, the manufacturing of these vehicles still produce significant amounts of GHG and pollution. In fact, the production of alternative vehicles is producing more GHG and pollutants than that of the production of ICEVs (Internal Combustion Vehicles) (Delucchi et al., 2014, p.12). Manufacturers still require resources such as electricity and raw materials, which are acquired through mining, material shipments, and coal power plants, which all contribute to the pollution. But according to Delucchi et al.,(2014), eventually those emissions will also be reduced, if they also make use of these new alternative technologies in their vehicles and factories. While manufacturers have yet to overcome the challenges associated with alternative vehicles, the solutions to these challenges are tangible and are to be implemented in the near future.

The petroleum industry is also a major stakeholder in the recent surge in the sale of HEVs and EVs. As more companies and consumers opt for alternative energy sources for their vehicles, the demand for oil and gasoline decreases, which means fewer sales oil companies and refineries. Because of this, there has recently been a drop in the oil consumption in the U.S., from 19 million barrels per day in 2009, to a projected 16 million barrels per day in 2030 (Zmud et al.,

2013, p.36). This change comes with the adoption and tightening of CAFE (Corporate Average Fuel Economy) laws, which essentially provide a standard for fuel consumption of vehicles in corporate fleets, and the adoption of alternative energy sources such as electricity and natural gas. As a result of reduced domestic oil consumption, the United States now has a greater supply of oil. Besides that, the United States has also been recently investing in domestic oil production in order to decrease dependency on oil from foreign countries, especially those in the Middle East. China and India are experiencing a rise in oil consumption and prices as well (Zmud et al., p 37) With lower domestic consumption, higher domestic production, and higher oil prices, U.S. oil companies are still able to remain profitable and sell their oil elsewhere, at a higher price, which in turn also improves the U.S. economy.

Another stakeholder in the development and promotion of alternative vehicles is the U.S. Government and the EPA. Currently the government is contributing to the development of newer, and more efficient transportation technologies through legislations. These legislations are under constant review as technology improves and vehicles become more efficient. One of these legislations is the CAFÉ. With this legislation, the government regulates the emissions of all new vehicles sold in the United States. As of 2012, the EPA enacted a standard of vehicles to have an average of 30.1mpg, and are hoping to increase that number up to 54.5 mpg by 2025 (Zmud et al., 2013, p.28). Due to these new rules, manufacturers have made drastic improvements in the quality of materials and fuel efficiency of ICEVs produced, which have also remained at a higher price point. As a result of higher quality vehicles, consumers are able to keep their vehicles for longer periods of time, and still save money (Zmud et al., p. 48). Besides the CAFE legislation, the U.S. government also gains from the promotion of alternative vehicles as it decreases domestic oil consumption. With decreased domestic consumption, and increased production, the

U.S. can be less dependent on foreign oil sourced from countries with unstable regimes (Graham et al., 2014, p.34). This may lead to better foreign relations with other countries and avoid any conflict due to discrepancies over petroleum.

The fourth, and possibly the most important stakeholder in the sale of EVs, HEVs, and ICEVs, is the consumer. Without consumers investing in alternative vehicles, production of would be difficult, if not impossible. For consumers, the largest issue with purchasing HEVs, and EVs, as opposed to an ICEV is the massive premium at which EVs are sold at compared to an ICEV. In 2014, the premium of purchasing an EV was between $10,000- $15,000 more than that of an ICEV (Graham et al., p.35) Although, according to Graham (2014), the operating costs of an EV is about 65% less than that of an equivalent ICEV and gasoline prices are expected to increase in the future, which would provide a boost to the interest in EVs. Another controversial issue with EVs and HEVs is that they lack appeal, particularly in the eyes of car enthusiasts. They are usually inconvenient to refuel, they are initially expensive, and some car enthusiasts feel as though they lack the joy of driving compared to that of an ICEV. For example, in “Cars & Culture: Motoring On,” Jack DeWitt describes his experiences with classic cars and compares them to modern cars and how they have changed. DeWitt describes his feelings as a car enthusiast as if classic cars had a true soul which rested in the inherently inefficient, loud, and obnoxious gasoline engines as opposed to modern engines which “look like canister vacuum cleaners and sound like them as well” (DeWitt, 2014, p.32). He ends by describing how the need for an enthusiast to prefer a classic, inefficient car as opposed to a newer, more efficient car is linked to the fact that people have a tendency to devote themselves in older things due to their feelings of nostalgia, in the same way that some people enjoy dated video game systems, or vintage cameras and clothing. (DeWitt, 2014, p.33). While this may impede the sale of HEVs

and EVs, there are relatively few car enthusiasts with this mindset compared to the majority of people who just use cars as a means of transportation.

The United States is in need of energy reform, especially in transportation. Although changes are slow, they are coming. Car manufacturers, the government, oil companies, and consumers all want to promote a cleaner environment, and a better world for everybody. Given enough time, the U.S. as a whole will eventually reach a point in which there are zero emissions while providing a cheap, efficient, and effective form of transportation for every person in the United States.

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