Novel Design of the RTS,S Malaria Process Train Employing Single Use Systems

Feasibility Analysis of Supercapacitive Vehicle Adoption

An Undergraduate Thesis Portfolio
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TABLE OF CONTENTS

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EXECUTIVE SUMMARY: A SOCIOTECHNICAL SYNTHESIS

The popularity of traditional internal combustion-powered vehicles (ICVs) results in significant carbon emissions. While this could be reduced by the use of fully-electric vehicles, many consumers are hesitant to adopt them for several reasons, including: limited range, high purchase price, long charging times, and limited accessibility to charging infrastructure. Supercapacitive electric vehicles (SEVs) provide comparable single-charge range and similar performance to battery-powered EVs (BEVs) and boast significantly faster chagrining times. Other than their power source, SEVs are constructed similarly to BEVs.

The adoption of SEVs depends not only on their technical abilities but also peoples' willingness to change their purchasing, driving, and riding habits. Car buyers care about more than just technical specifications when they make purchasing decisions. The reduced environmental impact of EVs and the improved charging ease of SEVs are two potential social factors that could shift these decisions. A desire of drivers to reduce their carbon footprint could encourage them to purchase SEVs instead of ICVs. Actor-Network Theory will be useful in the context of a feasibility analysis because it provides a framework for analyzing the entry of SEVs as a new nonhuman actor into the actor network. The adoption of SEVs represents the entry of a new nonhuman actor into the network, and this adoption will depend on the existing actors in the network.

I plan to perform a feasibility analysis based on technical data on existing BEVs and new supercapacitor technology, consumer opinions on EVs and transportation methods, and past cases of SEV use. The first goal of this research is to extrapolate the technical capabilities of a new SEV based on existing BEVs and supercapacitor technology. The next goal is to cross-reference these capability estimates with data on consumer habits and opinions to determine the

realistic percentage of drivers that could use an SEV with minimal changes to their behavior. The third goal of the research is to compare the feasible market size of SEV buyers for either individual owners or public transportation applications. Finally, the research will highlight the most significant challenges that SEVs face in entering the market.

This feasibility analysis will determine and convey how SEVs could be a viable avenue for more environmentally friendly transportation for individual consumers or public transportation networks. It will compile the strengths SEVs possess compared to traditional ICVs as well as their drawbacks, thus evaluating whether SEVs should be viewed as a viable product for manufacturers to design in an effort to reduce the carbon footprint of their vehicles. This new technology and the social ethics it carries have the potential to significantly reduce environmental pollution. By understanding its adoption I hope to gain insight into how people will shape the environment.