IPRO 351
SOLAR/BATTERY HYBRID THREE WHEELER RICKSHAW FOR INDIA




MISSION STATEMENT AND OBJECTIVES

Our mission is to investigate the feasibility of introducing solar/battery powered auto rickshaws into India's transportation industry. Our primary objectives were to perform a business and market analysis and to conduct research on solar-hybrid technology. Our secondary objective was to create design criteria based on the research.

PROBLEM

India's economy is rapidly developing and is becoming increasingly dependent on foreign oil. Currently it imports 60% of its yearly petroleum needs, and it is predicted that in 15 years it will have to import nearly 90%. This combination of heavy consumption and the wide use of inefficient two and three wheeled vehicles is leading to an environmental crisis. Air pollution in major cities from vehicular emissions are responsible for millions of health problems and premature deaths in India.

Solar-electric technology promises to reduce these problems. It is readily available, accessible throughout the country and doesn't suffer the supply issues of compressed natural gas (CNG). In addition it is subsidized by the government and is very affordable.

ORGANIZATION

For IPRO 351 we divided the objectives into two phases: the Research phase and the Design phase. The research phase composed of a "Business and Market Research Sub-Team Coordinator," and a "Technology Research Sub-Team Coordinator" and had three team members each. The Design phase had a "Visual Design Sub-Team Coordinator" with three team members.

ACCOMPLISHMENTS

The Business and Market research team discovered that India has several policies promoting alternative energy and local governments in major cities like Delhi have banned petrol powered auto rickshaws and only zero-emission auto rickshaws are allowed to operate in the city. The team also identified major players in this industry (primarily Bajaj) and tracked the development of other solar and electric projects in the works. From this data we decided that the best way to penetrate this market is to create a niche and offer solar/battery conversion kits to existing owners of petrol powered rickshaws. The design and specifications of these kits are yet to be determined.

The Technology team looked into component specifications and performed a economic analysis of an all electric, petrol and a CNG auto rickshaw. The team also used software to perform an ADVISOR simulation to determine the energy efficiency of an all electric rickshaw. Based on these simulations we concluded that in order to be successful the proposed conversion kits would have to meet or exceed the economics of a CNG auto rickshaw.

NEXT STEPS

- Establish design and specifications of the solar/battery conversion kits and/or an entirely new vehicle
- Design a working prototype
- Determine the cost of the solar components
- Create an implementation strategy

TEAM MEMBERS AND ADVISORS

Students

Daisy Agose	Exhibit/Final presentation Sub-Team Coordinator
Chukwuderaa Dike	Visual Design Sub-Team Coordinator
Hei Chang Lee	Meeting Coordinator
Allisah Love	Technical Research Sub-Team Coordinator
Tony Morales	Project Team Leader
Priscilla Mulhall	Business Research Sub-Team Coordinator

Advisors

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