

The Power to Move: Energy Choices for Public Transportation in the New Millennium

Abstract

Alternative fuels need to be introduced to our economy. The rising fossil fuel prices and heavy out put of pollution are visible signs that a new fuel is necessary to keep our transportation needs available. Team Pixar believes in a first step initiative that involves working with fleet vehicles such as taxis in order to solve this problem. In order to do this we suggest that a new infrastructure be put in place just for fleet vehicles with there new fuel. We would like to combine two of the major four fuels we researched in order to have the best possible fuel. We thought electricity and compressed air are the best combination for fleet vehicles. Team Pixar also sought to provide information on four possible alternative fuels that can be used to see the possible advantages that each of these fuels can provide once put in place.

Background

With fossil fuel prices doubling in September of 06 to September of 07 and our environment being polluted, Team Pixar thought it was time to get alternative fuels into today's market. The first thing we did was find out how an alternative fuel is a good fuel. A good alternative fuel needs to generate a net energy gain, environmental benefits, be economically cost competitive, and have the ability to be produced in large quantities. Hydrogen, Electricity, bio-fuels, and compressed air are the alternative fuels that fir the criteria for being a good alternative fuel. As shown in the chart, each of these fuels has potential to be used in our world. It also shows the pros and cons to each of these fuels that where researched.

Conclusion

When coming up with an alternative fuel Team Pixar came to the conclusion that in order to get the best qualities out of each fuel while also canceling out there downsides. We chose to combine compressed air with electricity because they cancel out each others weaknesses. For one compressed air does not generate any heat and has low performance. Electricity can add heat to the vehicle as well as some performance. One problem with electric cars is their recharge rate being slow. Compressed air on the other hand can refuel very fast.

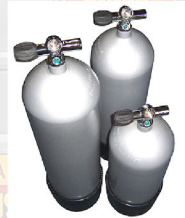


Statistics of Alternative Fuel Sources

	Biofuels (soybean)	Electricity	Hydrogen	Compressed Air
Carbon Footprint	<ul style="list-style-type: none"> •compared to gas 100% biodiesel produces about 400 less grams of CO2 per mile and about 250 less grams of CO2 per mile than diesel 	<ul style="list-style-type: none"> •No direct carbon footprint, but the electricity needed to recharge the battery creates pollution •The battery also creates waste when it can no longer hold a charge 	<ul style="list-style-type: none"> •No direct carbon footprint 	<ul style="list-style-type: none"> •There is no direct carbon footprint from a compressed air powered car, however the electricity used to compress the air creates pollution
Pros/Cons	<ul style="list-style-type: none"> •yields 93% more energy than energy invested •possibility of providing all fuel needs •more farms being built to supply soybeans, less natural environment 	<ul style="list-style-type: none"> •No GHG Emissions •Relatively quiet compared to other vehicles •Currently no way to charge the batteries at a fast rate 	<ul style="list-style-type: none"> •Completely environmentally friendly •Great source of energy •Very advanced 	<ul style="list-style-type: none"> •Cold air exhaust can become air-conditioning •No heat from engine •Easy to refuel
Cost Efficiency	<ul style="list-style-type: none"> •average biodiesel production averaged \$.55 per diesel EEL •all US soybean production would only meet 6% of diesel demand 	<ul style="list-style-type: none"> •cost 1\$ to recharge a battery •costs \$0.02 per mile opposed to gas getting \$0.04 	<ul style="list-style-type: none"> •Very expensive •Technology needs to be developed further 	<ul style="list-style-type: none"> •3 times less than gas •Estimated \$3 of electricity to fill tank •Possible safety concerns because of large tanks of compressed air may rupture or explode in a crash. •Low performance. •Limited range.
Readiness For Implementation	<ul style="list-style-type: none"> •2005 soybean extract used to make biodiesel was taken from 1.5% from the total us harvest and was used to create .09% of diesel usage 	<ul style="list-style-type: none"> •The market for electric vehicles is being held back by the lack of battery technology 	<ul style="list-style-type: none"> •Expensive •Not ready for mass production 	<ul style="list-style-type: none"> •Compressed air powered vehicles are not quite ready for production. •Still in the development stages they are almost ready. There are cars currently available outside the US but currently they have serious limitations

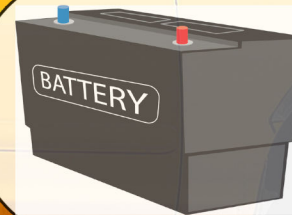
Methodology

- Research Alternative fuel options
- Find pros and cons of each fuel
- Is each fuel ready for implementation
- Choose the best alternative fuel for taxis
- Implement Infrastructure at Taxi Depots
- Market for Alternative fuels in other vehicle types



Goals

- Provide a first step to introducing alternative fuels to the United State's larger cities.
- Hope that this first step will get noticed and spread throughout the US and eventually the world
- Provide information about different alternative fuels to onlookers who want to get involved



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