

WPI

Electric Versus Hybrid Fleets in the Private Sector

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Abstract

Conventional vehicles utilize old technologies that are harmful to the environment. Gas powered engines are inefficient, especially compared to Hybrid-Electric and Electric vehicles. Gas-powered vehicles contribute to the issue of Global Warming, and also further deplete the world's oil supply. Private Companies have more freedom which vehicles they utilize because they have not been regulated by the government. Some companies, such as Fed-Ex and UPS, have already begun to make small changes, using more efficient hybrid vehicles. The goal of this project is to discover whether the Conventional, Hybrid-Electric, or Electric Fleet-vehicle is the best option. When compared through maintenance cost and dollars per mile (efficiency,) the Hybrid Vehicle made the most economical sense.

Project Goal

The goal for this project is to look into the pros/cons of incorporating hybrids and electric vehicles into large-scale vehicle fleets in suburban areas (neighborhoods, medium-light traffic). This project focuses on delivery vehicles and focus on the advantages hybrids (plug-ins/regenerative) and solely electric as compared to the typical gas/diesel vehicle. They are compared through cost/mile in relation to MPG, and the costs associated with production and maintenance.

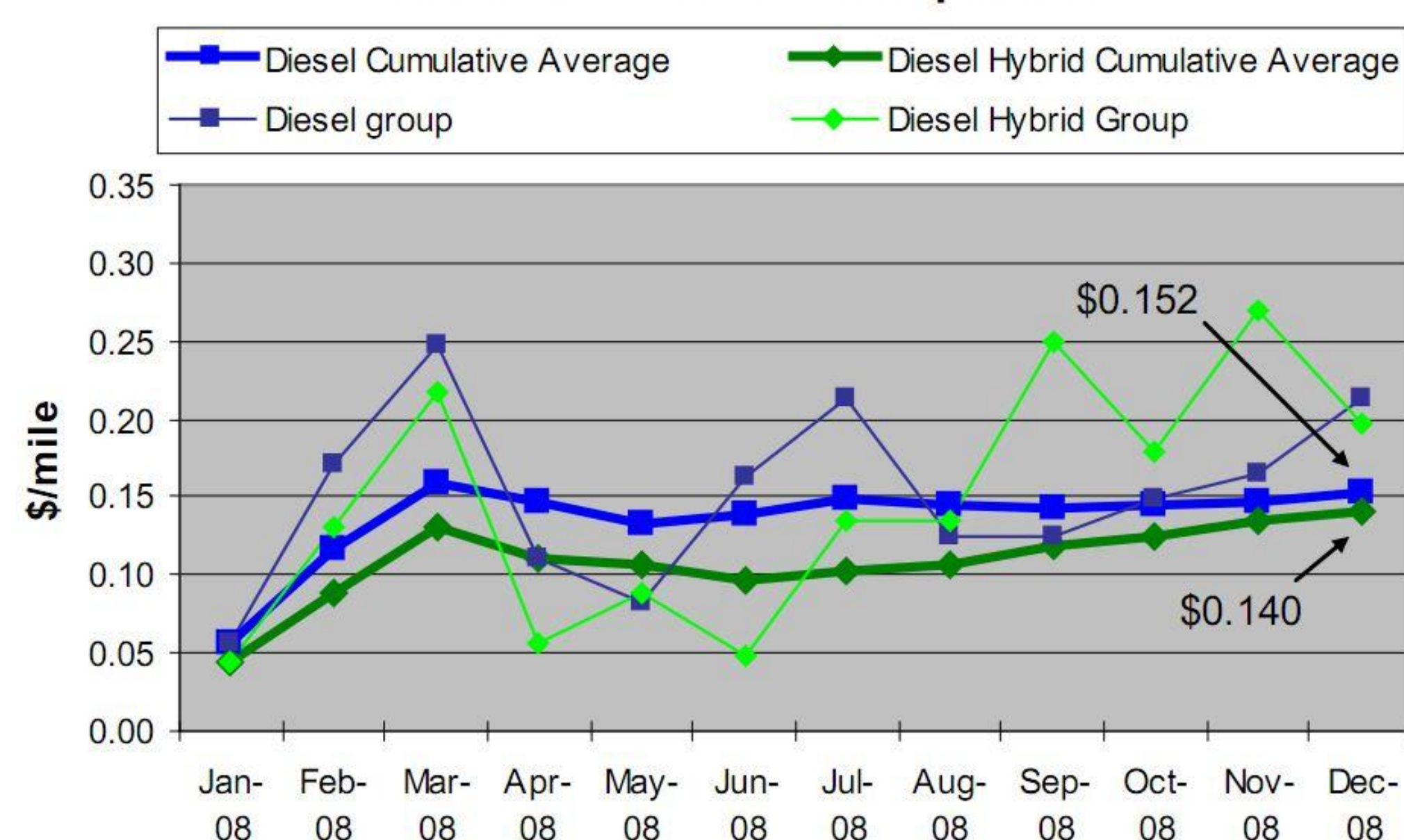


<http://green.autoblog.com/photos/ups-hev-delivery-truck/full>

Background

- Hybrid-electric technology has been around since the 1900's but dropped in popularity as combustion engine technology advanced more rapidly than energy storage technology.
- In the late 1990's, UPS launched a research project looking into the possibility of incorporating hybrids into their fleet.
- The first Hybrid-electric delivery vehicle was deployed in Huntsville, Alabama (UPS, 2010).
- By the end of 2009, FedEx employed over 325 HEVs (FedEx, 2010).
- The chassis for the hybrid-electric and the diesel are both built by Freightliner. The hybrid drive used in the vehicles is produced by Eaton Corp.

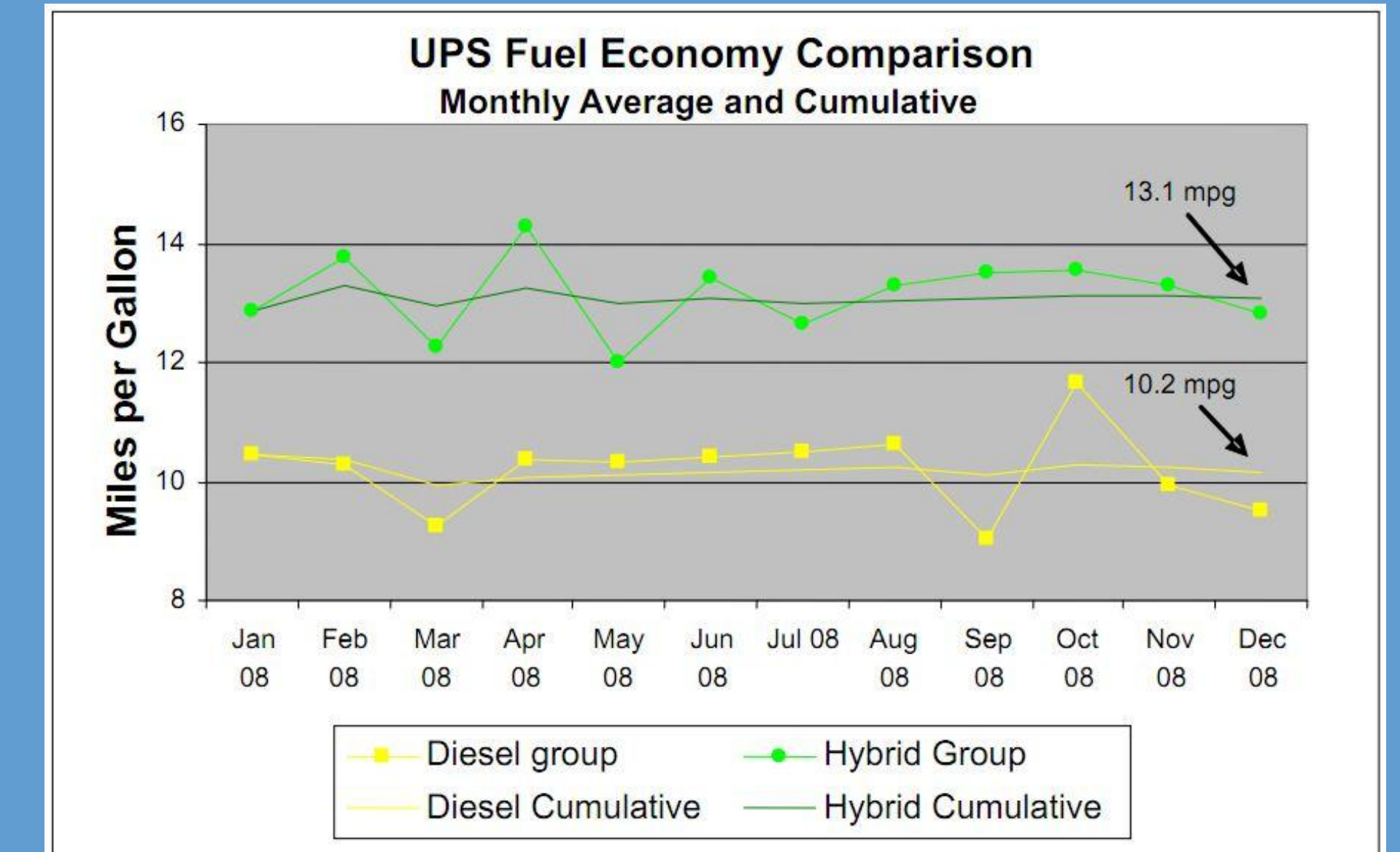
Total Maintenance Cost per Mile



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Results

- Lowest operational costs - Hybrid vehicles based on high efficiency and low maintenance costs
- Longest range - Diesel powered trucks
- Lowest emissions - Electric vehicles
- Greatest efficiency (in cost/mile) - Electric Vehicles



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Methods

We Investigated:

- Companies already utilizing technologies
- Cost per mile to operate
- Cost of maintenance
- Cost of production

Conclusions

- Hybrid-electrics are better due to reduced operational cost and lower emissions .
- Diesels are better traveling further distances (highway speeds), hybrids are designed to operate at lower speeds.
- To make HEVs even more economical, government grants would help to reduce production costs. The government could also give tax breaks to those companies employing HEVs in their fleets based on emissions.

References

UPS. (2010, September 30). UPS Purchases 130 Hybrid Electric Vehicles - UPS Pressroom. Home - UPS Pressroom. Retrieved December 1, 2010, from <http://www.pressroom.ups.com/Press+Releases/Archive/2010/Q3/UPS+Purchases+130+Hybrid+Electric+Vehicles>

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<http://about.fedex.designcdt.com/corporate_responsibility/the_environment/alternative_energy/cleaner_vehicles