

# Broadening horizons in the alternative fuel vehicle market

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The automotive sector continues to research ways of saving on traditional fuel and expanding alternatives. However, this change has not really moved forward due to the cost-prohibitive nature of new technology. Some of the most commonly discussed alternatives are battery-powered cars, namely electric vehicles, hybrid electric vehicles, and fuel cell vehicles. In the category of electric vehicles, options include using a partial amount of traditional gasoline along with high-profile electric batteries. This essentially increases the mileage, providing more distance per gallon as the battery is also assisting. The market governed by mild hybrid vehicles has grown significantly since Asian car makers launched them several years ago. However, gas-powered cars continue to rule the roads. This indicates little progress and fewer infrastructures to help support such massive changes.

### **Different types of alternative fuel vehicles**

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The different alternatives available in the market range from mild and micro hybrids to full hybrids among battery assist vehicles. The use of batteries, along with a bank of ultracapacitors, is capable of performing highly redundant operations in vehicles such as start and stop. For example, city vehicles like garbage trucks and buses are vehicles that have regular stop and start cycles in intervals of three to five minutes. These vehicles are the best applications to use the power-dense features of an ultracapacitor, which uses its resources to provide the high power required during initial start and stores the power during stop operations.

### **Fuel cell vehicle**

Investments in fuel cell vehicles provide end users with some significant tax incentives. Plus, they reduce the use of gasoline but requires a source of hydrogen for smooth functioning.

Hyundai plans to use the ix35 SUV as a fuel cell vehicle and is currently in the roll-out phase. This is called the Tucson, and its acceptance in the market will determine production of 1,000 such vehicles in 2015. Although a bold move, this is an avenue to showcase the kind of opportunity provided by the fuel cell. This vehicle will never succumb to low battery situations and stop, but it will run for any distance as long as hydrogen tanks are supplemented.

Hyundai is not the only car manufacturer pursuing such a trend. Toyota and Honda, which are neck-to-neck competitors also plan on a similar fuel cell vehicle release in 2015. However, Honda already has garnered data on the running of such vehicles through its FCX Clarity that was available in the U.S. market, especially in California, for lease. These run results will provide Honda with valuable data on re-engineering their upcoming product line.

Much cannot be said without covering an infrastructural outlook on availability of hydrogen. Car manufacturers such as Honda, Toyota, and Nissan are actively pursuing interest from European countries. A recent example is a memorandum of understanding with Denmark, Norway, Sweden, and Iceland, also called the Nordic four. There is much interest in driving the development of fuel cell infrastructure to support the growth of these vehicles. This memorandum spans the years between 2014 and 2017. This memorandum has had a predecessor in 2011, which were car manufacturers Hyundai and Kia.

### **Commercial battery-powered vehicle**

Although there is much talk about the fully battery-powered electric vehicle, progress has been slow. When the rubber meets the road, these vehicles seldom satisfy the core performance needs, especially for car enthusiasts willing to invest a premium in the technology. This performance dimension adds to all other aspects of technology adoption, particularly the high cost of purchase as well as maintenance. In December, 2012 there was a new initiative in Chicago to build an electric vehicle manufacturing facility. This is endorsed by the mayor, and it is provided with the necessary political boost to enable such a venture to thrive. Smith Electric Vehicles has the vision of manufacturing zero-emission commercial electric vehicles, and it already has a technology that has been rolled out in the market. The company promises a lower cost of ownership, high performance reliability for urban routes, zero emissions, and full support to enable such a transformation. This venture was the brainchild of the government, which put in place a voucher plan to push forward a radical change from diesel to zero-emission vehicles.

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The city has the funds to provide incentives to push for such a change and partner with a company with the expertise and technical know-how on making such a radical change. Currently, a large number of vehicles that run on compressed natural gas are running in the city itself.

### **The next five years**

That brings us to the future and what the next five years might have in store for alternative fuel vehicles. Although the technology is ready for the road, the infrastructure is just not there to enable such a move. The first movers and shakers in this industry from an infrastructure standpoint are European countries such as those in the Nordic four. Hence, with trendsetters such as these, there seems to be a lot of ground to make up in the next five years. This period could be a crucial one to help push the market forward and bring about a real change in the way vehicles and its fuel is viewed

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