Covalence
Ethical quotation system

COVALENCE ANALYST PAPERS

The Role of Automakers in Sustainable Development: "Petroleum is consumed away, let's use electricity"

Nilay Kavur | Bosphorus University Istanbul (Turkey), intern analyst, Covalence SA, Geneva, 14.02.2008

Introduction:

Throughout history, there have been many conflicts and wars in the sake of petroleum and only in about 60 years, this energy source will be entirely consumed away. Today, 80% of energy consumed by humankind depends on the petroleum's derivatives. According to the research done by fuel companies, fuel reserves will start diminishing by 2015 and will be consumed away until 2070's. In the coming years, we will be coping with the scarcity of fuel in every arena. So the coming question is very simple and concrete. "How will the humankind survive in a world without petroleum; what will we use for heating, in cars and in planes?" Scientists have an increasing effort to develop alternative options to fossil fuel.

In this report, I intend to mention recent achievements in the car industry in the sake of sustainable development. Until now, one of the alternatives to fuel is found out to be hydrogen; however it is too expensive. So, instead, the most efficient solution embraced by car industry has come out to be the idea of hybrid cars which switch between petrol and electricity. This car carries both of the energy sources and is accepted as the best alternative in terms of power, performance and commercialization. However, due to the high prices, demand for hybrid cars is still low; thus automakers produce them in limited numbers. Hopefully, it is expected that, these hybrid cars will have a very big influence in the auto market until 2030's. By that time, the fuel reserves will be pretty finished. So, the next aim will be selling hydrogen energy in reasonable prices. Until then, automakers work on hybrid cars. According to the research done by Price Water House Coopers, until 2010, there will be 74 different models of hybrid cars and sales of these new models will rise to 1 million. On the other hand, Garel Rhys, as the head of the department of the Research on Automotive Industry in Cardiff University, claims that hybrid cars are still problematic in terms of economy; "hybrid cars are far more expensive than the classical cars", he says.

Why should we prefer hybrid cars? How do hybrid cars work?

Before, concentrating on the contributions of various automakers in fuel efficient works, let's take a closer look at how these complex machines work. If, we, as consumers, know more about the important details of the product, we are more capable of rewarding companies that aim to take sustainable development measures.

Simply, the purpose of these hybrid cars is to decrease the amount of fuel used. In order to understand the hybrid car better, the differences between the gas-powered car and an electrical car should be examined:

The former has a fuel tank that supplies gasoline to the engine. The engine turns a transmission which turns the wheels. The latter, has a set of batteries which provides electricity to an electric motor. This motor turns a transmission which turns the wheels.

There are two main problems of a gasoline car; one is that it produces a large amount of pollution and secondly, it generally gets poor gas mileage. An electric car produces almost no pollution but it can only go 50 to 100 miles (80-161 km) before recharging. Moreover the electric car is too slow and inconvenient to recharge. Finally, the gasoline-electric hybrid car is just what it sounds like, a compromise between these two. It increases the mileage and reduces the emissions of a gas-powered car, at the same time, overcomes the shortcomings of an electric car. In short, it combines these two systems with both gas and electric power. It uses gasoline to accelerate the car and when the engine has a considerable power, the electric-engine starts to work and this way, the consuming of gasoline is reduced.

Most conventional cars require a big engine to produce enough power to accelerate the car quickly. However, in a small engine, efficiency can be improved by using smaller and lighter parts and by reducing the number of cylinders. The gasoline engine can be smaller in a hybrid car than in a conventional car; so the hybrid car is more efficient. In short, if a gasoline car and a hybrid car are driving at the same speed along the freeway, hybrid car will use less energy with its smaller engine. The small engine uses less power to drive itself. When we drive at low speed, electric-engine is sufficient. The car switches to both gasoline-engine and electric engine when the car accelerates. In other words, we use electric-engine in cities and gasoline-electric engines in high ways. Mostly, only electric-engine is sufficient for hybrid cars in the cities.

How do hybrid cars provide energy efficiency?

Hybrid cars recover energy and store it in the battery. In a conventional car, when we step on the brake pedal, we remove energy. Hybrid cars can capture some of this energy in the battery for later usage because they can use the electric motor to slow the car besides the brakes. So the electric motor charges the batteries while the car is slowing down. Moreover, the hybrid car can turn off the gasoline engine when the vehicle is stopped at a red light. Furthermore, hybrid cars use special tires that are inflated to higher pressure, so they cause less drag than conventional tires.

Consequently, hybrid cars save energy. Hybrid technology works for regaining the energy that is lost in classic cars, decreasing the amount of fuel consumed and preventing pollution. Moreover, these cars do not make noise while working with electric engine. Besides, according to the predictions made for 2010, hybrid cars will contribute to the green house effect 46% less, compared to the classic cars. One may wonder the about the environmental consequences of batteries that are treated as waste. Today's hybrids use NiMH (Nickel metal hydride) batteries, which are not environmentally problematic. Editor of the Green Car Journal, Ron Cogan states that NiMH batteries can be fully recycled. Hopefully, Toyota and Honda state that the dead batteries will be recycled and will pose no toxic hazards. Toyota puts a phone number on each battery, and they pay a $200 "bounty" for each battery to help ensure that it will be properly recycled. [1]

Various Automakers in Hybrid Car Industry

The history of hybrid car industry is long enough to cover the last century. After a few attempts in the beginning of 20th century, Ferdinand Porsche engineered the fist successful hybrid electric car in 1928. Until today, various forms of hybrid cars have been engineered. However, hybrid-electric cars became widely available to the public only in the 1990's with the introduction of the Honda Insight and Toyota Prius.

Toyota Prius, which is designed to reduce emissions in urban areas, is the most popular current model, with over 200,000 sold worldwide. For this model, which came out in Japan in 1997, Toyota designed a parallel hybrid power train that is called the Toyota Hybrid System. It is capable of accelerating the vehicle to speeds up to 15 mph (24 kph) on electric power alone. According to Kazuo Okamoto, the director of research and development department of Toyota, "roads will be full of

[1] "Hybrid Electric Vehicle", http://en.wikipedia.org/wiki/Hybrid_electric_vehicle

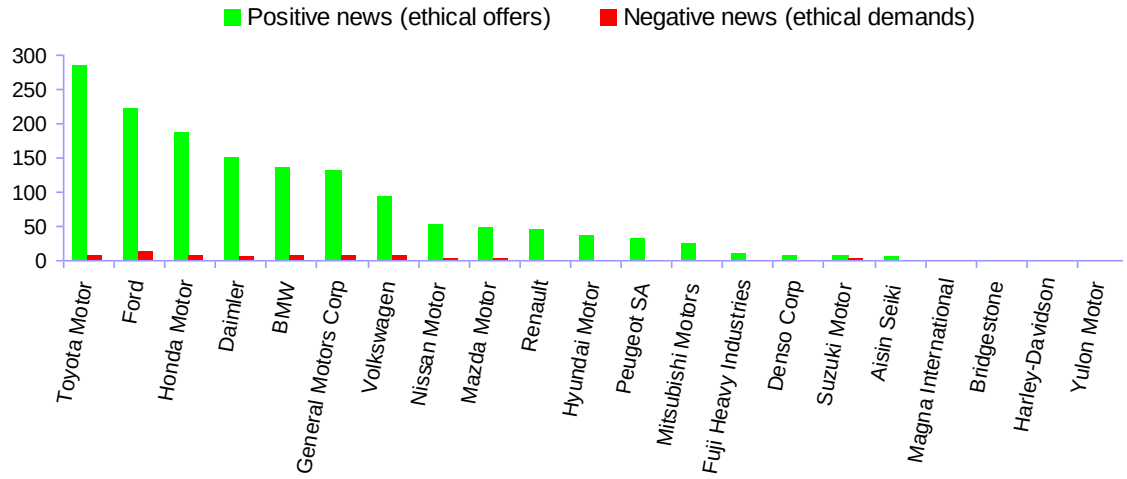
hybrid cars until 2010". He predicts that Toyota's hybrid model, Prius, will have a significant place in the European market. The Prius model has been chosen as the 2004 North American Car of the year and it has been demanded from the very beginning. Hopefully, newer designs are less expensive. Moreover, they have the similar performance to non-hybrid cars, at the same time they offer 40% fuel efficiency. Honda Civic Hybrid is a specific example to this.

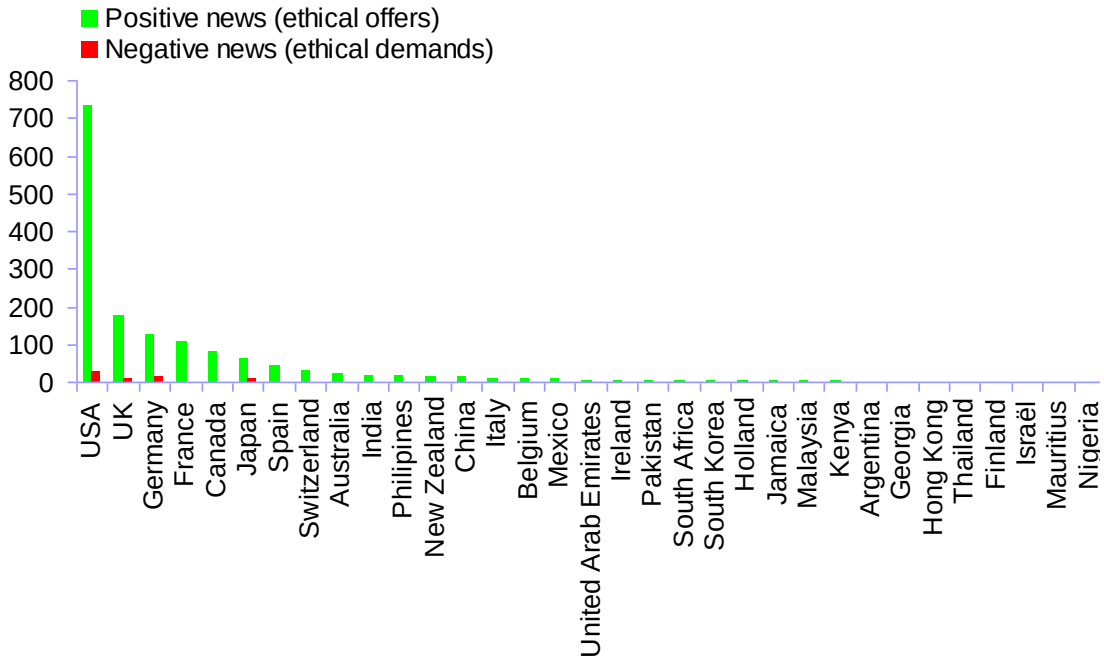
It has been stated that Toyota is planning to sell cars that with ion-lithium batteries until 2010. So, the partnership between Toyota and Panasonic has gained significance due to this plan. Toyota's biggest competitor in US, namely, General Motors, plans to mass produce its Chey Volt that works with ion-lithium, in 2010, in this respect.

There are a lot of hybrid models in the market these days and most automobile manufacturers have announced plans to manufacture their own versions. In 2008, manufacturers are going to introduce 15 new hybrids. Here are some of the hybrid cars:

Honda Civic Hybrid, Honda Accord Hybrid, Nissan Altima, Toyota Prius, Toyota Camry Hybrid, Ford Escape Hybrid SUV, Lexus 400h Hybrid SUV, Toyota Highlander Hybrid SUV, Mercury Mariner Hybrid SUV, Mazda Tribure compact SUV, etc. (The list of all hybrid cars of past and future series can be viewed in the Wikipedia.)

Covalence, as a company that tracks the ethical reputation of multinational companies via an ethical quotation system composed of 45 criteria is concerned about eco-innovative products. So Covalence keeps a track of new products or services offered by multinational companies that are environmentally friendly. The progress in hybrid car technology is significant to Covalence regarding sustainable development. Below, there are two charts from Covalence. The first chart shows us the range of all car manufacturers and their success in terms of taking environmental-friendly steps. The second chart gives us an opinion about different countries' attitudes towards eco-innovative products.





Conclusion:

In past, companies did not care about sustainable business and development as they kept competing just with products. Hopefully, with demands from customers, environmentalists and NGO's, now, corporations have taken a different approach to consumer demands and sustainable development. Basically, consumers recognize the importance of energy efficiency and demand environmentally-friendly products. Recently, companies' positive responses have increased considerably. Hopefully, we will see more eco-innovative products in the future.

Bibliography:

"Environmental Cars"
http://www.discoverychannel.co.uk/cars/now/environmental/index.shtml

"How Hybrid Cars Work?" by Julia Layton and Karim Nice
http://auto.howstuffworks.com/hybrid-car11.htm

"Hybrid Electric Vehicle"
http://en.wikipedia.org/wiki/Hybrid_electric_vehicle

"Hybrid Cars"
http://www.care2.com/channels/ecoinfo/hybrid

"How Does a Hybrid Car Work?"
http://auto.howstuffworks.com/question262.htm