# Dirty Dinosaurs Destined to Dwindle

*By Vance Bloom*

**Long ago, dinosaurs roamed the earth in lush tropical forests. A global catastrophe, such as a flood or an ice age, caused the plants and animals to die out and become buried in the earth. According to the Biogenic Theory, crude oil was formed from the decayed remains of prehistoric animals and earthly plants. This organic substance, mixed with silt, was buried under thick sedimentary layers of earth. Over many centuries, the high levels of heat and pressure caused the residue to transform into liquid and gaseous hydrocarbons. These substances then moved through rock layers until they became trapped underground in porous rock pockets that later formed oil fields, from which the liquid could be extracted by drilling and pumping ("Biogenic"). In the fourth century, the Chinese were first to burn crude oil as a fuel to evaporate salt water brine and create salt ("Petroleum").**

**Fifteen centuries later, in 1876, Nikolaus Otto built the first four-stroke engine, which was later adapted and used to power the automobile ("Internal"). The invention of the automobile revolutionized the way people traveled, but as its popularity grew, the problems began. The automobile went from a rich man's novelty in its inception to the average person's necessity, and the number of vehicles on the road grew. Problems began to stem from vehicles' exhaust emissions, causing air pollution in urban areas; farmers started noticing unusual damage to crops; health problems started to surface and pointed to air pollution as the culprit. Almost a century after Otto's invention, California became the first state in America to realize there was a problem and take corrective action. In fact, California legislature required the state to establish air quality standards and controls on motor vehicle emissions**

**in 1959 ("Southland's"). As a result, air pollution decreased; nevertheless, serious emission problems remained, so, in September 2004, California passed the strictest vehicle anti-pollution law in the world.**

**Unfortunately, air pollution is not the only problem associated with fossil fuels. Today, the price of crude oil in the Mid-East is ever increasing, fossil fuels are becoming more difficult to extract, and the demand for fuel to power automobiles is ever escalating. The need for newer, cleaner, renewable power technologies is clear. The century-old, environment-destroying, gasoline-powered, internal-combustion, automotive engine is headed the way of the dinosaur. Since fossil fuels are a non-renewable energy source, have a tendency to pollute the environment, and put the United States at the disadvantage of having to deal with the whims of Middle-Eastern countries, it makes sense that they should give way to newer, cleaner technologies including (I) electric vehicles, (II) alternative fuels, (III) hybrid vehicles, and finally (IV) hydrogen fuel-cell powered vehicles.**

**First, the non-polluting electric vehicle is not a new concept. The earliest electric vehicle was introduced by Detroit Electric back in 1907 and eventually gave way to the more powerful, faster-traveling gasoline vehicles ("Detroit").**

> **The electric vehicle was mainly sold to women drivers and physicians who desired the dependable and immediate start without the physically demanding hand cranking of the engine which was required with most early internal combustion engine autos ("Detroit").**

**More recently, General Motors (GM) produced the EV1 electric vehicle from 1996 to 1999. The EV1 had many limitations, including a short range of 55 to 95 miles between re-charging, a charging time of up to eight hours, and a need for periodic**

**replacement of very expensive batteries. Leasing was the only way a consumer could acquire one of these vehicles ("Frequently"). GM wanted to create a consistent cost of ownership, so, a monthly lease including tows, maintenance, and repairs, made the EV1 equally affordable to all drivers. With technology constantly changing and improving, this gave GM the option of recalling these cars back in to make modifications ("Frequently"). Additional advantages of this electric vehicle included extremely quiet operation, 1/3 to 1/2 the fuel cost of comparable gasoline use, and very quick acceleration. The EV1 was so quick that a modified version of it set a land speed record for electric vehicles, reaching 183 mph in 1994 ("General"). GM discontinued leasing of EV1 vehicles in 2003, and the vehicles were destroyed ("General"). Some of the electric vehicle technology is still used today in hybrids and promises to be an integral part of the future for hydrogen fuel-cell vehicles.**

**Secondly, alternative fuels such as methanol, liquid propane gas (LPG), compressed natural gas (CNG), and bio-diesel are becoming more attractive, as dirty-burning, non-renewable petroleum costs soar with no limit in sight. During World War II, methanol came into use as an automotive fuel because of the scarcity of gasoline, which was mostly being diverted from public to military purposes. One advantage was that methanol was an easily renewable resource that was distilled from grain. One disadvantage of methanol was the reduced flammability and lack of power due to its lower density in comparison to an equal volume of gasoline. Today, if a motorist were to look at the black sticker on any gasoline pump in California, he or she would notice that gasoline has been diluted by adding methanol during the colder winter months when cars use more fuel during longer warm-ups, the addition thereby reducing carbon monoxide emissions.**

**With stricter tailpipe emission requirements, LPG**

**and CNG have become more popular in the last ten years due to their clean burning properties and lower emission levels. According to Roddy Rampersad, automotive director of Mount San Jacinto College, "These types of fuels (LPG and CNG) have become especially popular with busses and government fleet vehicles" (Rampersad).**

**Another low emission fuel, bio-diesel, is also quickly becoming more widely utilized: it reduces SMOG producing emissions by 67% over regular diesel fuel; it is easily renewable, being made from soybeans or other vegetable oil producing crops; and it is a superior lubricant ("Bio-Diesel"). Bio-Diesel is currently available at pumps as a "blend," being mixed with regular petroleum based diesel fuel in different percentages. Over 300 mostly government fleets are using bio-diesel today because of its cleaner burning characteristics. There are presently more than 14 companies that have invested millions of dollars into the development of bio-diesel manufacturing plants and actively marketing bio-diesel ("Myths"). Clearly, since bio-diesel can be easily produced from crops and burns much cleaner than fossil diesel fuel, it has a place in the future of the transportation industry. As time goes on, perhaps other synthetic fuels will be developed and produced as well.**

**Thirdly, hybrid vehicles have been recently re-introduced to the market with great success, unlike the original unpopular hybrid car that was designed by Ferdinand Porsche in 1928 which had a top speed of twenty mph, hybrids now offer excellent acceleration, remarkable fuel economy, and ultra-low emissions ("Hybrid"). The 2004 Toyota Prius sported a thrifty 44 mpg, while the 2005 Honda Insight got an impressive 51 mpg overall. By the end of this year, several more hybrids are scheduled to be introduced: The Honda Accord Hybrid, which boasted even more acceleration than the regular Accord V-6 (255hp vs. 240hp) has been fazed out because the fuel economy was less than impressive; The Toyota Highlander Hybrid**

**and Lexus RX400h SUVs, which also claim to be faster and more efficient than their gasoline counterparts ("Fueling"); The Subaru B9SC Hybrid is also on the books to be introduced in the near future ("Clean"). According to Jim Press, C.E.O. of Toyota Motor Corporation, Toyota has set a goal of putting 300,000 hybrid vehicles on the road worldwide by mid-decade (Press). Because hybrids will dramatically cut harmful pollution and reduce $CO_2$ greenhouse emissions while passing vehicle SMOG Check testing with flying colors, they will certainly play an important role in the near future of automotive technology.**

**Ultimately, the distant future points to the zero-emission hydrogen fuel-cell vehicle as the long-term solution to replacing dirty-burning gasoline and petroleum fuel-based engines, even including the hybrids. The benefits of the hydrogen fuel-cell vehicle include great power, easily available fuel sources, absence of emissions, and zero greenhouse gas production (Press). The hydrogen fuel-cell is an extremely powerful battery that produces electricity by burning hydrogen fuel and then powering a high-efficiency, zero-emission producing, high-torque, electric motor. Hydrogen is the most abundant element in the universe, and hydrogen fuel can be made from many sources including water, vegetable matter, or even petroleum products. When hydrogen burns in a battery cell, the only by-product that is released into the atmosphere is warm water vapor. If only hydrogen fuel-cell vehicles were driven, pollution from transportation would be a thing of the past. While the hydrogen fuel-celled vehicle is the long-term future solution to replacing fossil fuels, there are still a few difficulties to be worked out: There are almost no hydrogen producing or refilling stations in place (only 13 refueling stations in California)(Llanos); the cost of the fuel-cell must be extraordinarily high, since the cost of the Honda FCX is over 1.5 million dollars (Llanos); the life expectancy of the**

**fuel-cell seems to be fairly short insofar as, in the test case cited, Honda replaced the fuel-cell after only 7,000 miles; the amount of compressed hydrogen that can be carried on-board limits the range to less than 200 miles (Llanos). The progress that has been made in the last couple of years on the fuel-cell vehicle concept promises that these obstacles will be overcome.**

**The future of vehicle technology continues to advance, and as it moves forward, it seems as though the dinosaurs will end up being left far behind. Alternative fuels are making an impact on cleaner air, and as production increases with the popularity of these fuels, the need for crude oil will level off or even diminish. Hybrid vehicles, even though they still use fossil fuels, are more energy efficient, easier on the environment, and will be a major player in the immediate future of automobiles. According to Steve Adkison, service director for the Gosch Automotive Group, "hybrid vehicles are making such an impact on the automobile market that the manufacturers have a six-month back log of orders" (Adkison). However, it appears that the real solution to "burying" the dinosaur for the long term and cleaning up the environment is the hydrogen fuel-cell vehicle, which certainly can be called *THE* car of the future.**

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