

# The Green Car and Alternative Fuels Quiz—Answers



1. The pure Electric Vehicle (EV), not hybrid, has never been fully mainstreamed, and automakers claim that there hasn't been sufficient interest in its development and manufacture. YET, General Motors made its 2 seater EV-1 in the late 1990's and leased it to a couple thousand drivers, who promptly were smitten. It had freeway acceleration, styling, a range of up to 80 miles on a charge, and a network of plug-in stations was beginning to be established. About the same time Toyota produced its small SUV, the Rav 4, and Ford its electric powered Ranger. In the early 90's California regulators were mandating zero emission vehicles for a portion of its automotive stock, but backed down later when manufacturers convinced them this could basically be accomplished with cars that had ICE's (internal combustion engines). The market fell out for EV's, yet hundreds protested when automakers attempted to withdraw them, which they legally could do since most were only leased. With the technology that existed THEN, adding longer range batteries, these EV's could have gone as far as 200 miles on a charge, making them quite practical for all but the most horrid day to day commutes. Only a few Toyota Rav 4's remain in private or municipal hands. The EV-1 fleet was totally destroyed. NEV's (Neighborhood Electric Vehicles) exist, such as Daimler Chrysler's GemCar, but are restricted to surface streets since they can go only 25 mph or so. There are some manufacturers of freeway safe EV's, such as the Tango, but initial production costs are so steep that few can own one. The EV actually represents what the hybrid vehicle (HEV) should evolve to, as the gasoline propulsion component is eventually eliminated or greatly reduced. An indy film, *Who Killed the Electric Car?*, is getting good press as I write at film festivals. **FALSE**

2. That country is Brazil, which recently declared that it was no longer dependent on any oil imports from outside its borders. For some years Brazilians have been growing sugar cane to make alcohol fuel, or ethanol, which is used in Flex Fuel Vehicles (FFV's), manufactured both in Brazil and in the U.S. FFV's can run on either gas or ethanol. 80% of Brazil's vehicles are now using some ethanol--and many of those use "E96", which is ethanol fuel which contains no gasoline, with 4% water. (When gas prices escalated in the last couple years, Brazilians immediately began adding 50-60% alcohol, with no ill effects to their car engines that were NOT then Flex Fuel). **TRUE**

3. It was only recently that the Associated Press reported that an "average motorist" in Southern California was testing out the first consumer model of Honda's FCX hydrogen fuel cell powered car. Others are being tested as fleet cars. Hydrogen cars in your driveway are at least five years away, and even then will be extremely expensive--today's test models cost over \$1 million each. There is no network of fueling stations anywhere in the U.S., though students at the University of Victoria in Canada have designed one. In my opinion, fuel cell powered cars are Buck Rogers kind of stuff, and it will be years before they become accessible to the average person. Some experts feel the fuel cell is better placed in energy generating systems, not cars, which have storage and safety issues related to the highly compressed gas. The "hype about hydrogen" has resulted in a shift away from other more viable alternatives that could come on line in far less than a half dozen years. **FALSE**

4. Peak Oil refers to the world or a country reaching the zenith of its production, and its adherents presume that no long term sources of crude will be found once the peak has been reached. This has proven true in the United States, which oil geologist M. King Hubbert predicted in the 50's would peak in the early 70's. It did so in 1971, and the U.S., which once supplied half the world's oil, never recovered its hegemony, and now can supply only a fraction of its own oil needs. The peaking of oil worldwide has been predicted between 2000-2020, with most estimates falling somewhere in the middle. When enough oil can no longer be discovered to meet the needs of the world's industrial giants--such as emerging China and India--the implications are very serious for "civilization" in general. Many well respected scientists and economic professionals, including a Bush

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advisor, are predicting disaster. Books such as *The Long Emergency*, *The End of Oil*, and *Twilight in the Desert* are now appearing by the dozens, heralding the inevitability of a decline in material prosperity--especially in the developed world. **FALSE**

5. Rudolph Diesel invented his highly efficient engine to run on peanut, and other, vegetable oils. Yet because petroleum was so cheap early in the turn of the century, crude oil began being refined into what has turned out to be a highly polluting (and smelly) fuel that powers mostly trucks (about 2% of the passenger vehicle fleet in the U.S. is diesel, although the figure is closer to 30% in Europe). Diesel engines are at least 30% more efficient than ICE's, and at one time diesel fuel was cheaper than gasoline. Biodiesel is made from vegetable oils, recently processed or "surplus" (as in fryer oils) that can be modified somewhat to make a much less polluting fuel. The fuel can be made safely at home for less than \$1 gallon using one of several processing units available commercially. **TRUE**

6. Only about 15% of our crude oil is imported from middle eastern countries such as Saudi Arabia, Kuwait and Iraq. The lion's share comes from Venezuela, Nigeria, Mexico, Canada and our own fields, such as in Prudhoe Bay. There is a perception that we are in Iraq because of its vast oil reserves. This is certainly one factor, well hidden from public view until Freedom of Information Act documents revealed that prior to the Iraq War, and 9/11, a detailed analysis of Iraq's fields had been made by Vice President Cheney's Energy Task Force. Yet as huge (and at one time, cheap) Iraq's oil was or has been, it is not essential to our society's economic well being. **FALSE**

7. It's not very often thought about, but the infrastructure required to transport billions of gallons of gasoline fuel via tanker trucks from distant ports to your neighborhood service station is hugely expensive and grossly inefficient. Especially when you consider that millions of gallons of fuel must be BURNED to get other fuel, yet unburned, to market. Such a system is also highly vulnerable to terrorism and bottlenecks on the nation's crowded highways. The author has concluded that an alternative fuels industry dovetails nicely with the concept of the Garage Filling Station, whereby much fueling is done at home. Biofuels can be safely processed and stored at home, solar panels can charge an electric car or "plug-in" hybrid--there is even a garageable natural gas dispensing unit for vehicles like the Honda GX which is CNG propelled. The Garage Filling Station could be the service station of the future once oil companies lose their grip on the distribution system. **FALSE**

8. A gasoline shortage such as existed during the Oil Embargo of 1973 could be entirely prevented by measures starting to be taken as I write in promoting ethanol fuel, available in 500 locations nationwide as "E85." (Chevron and Wal-mart are poised to expand into ethanol pumps). Ethanol can be made from corn, switchgrass, wood pulp and other cellulosic materials. Internal combustion engines need to be adjusted to compensate for the higher compression ratios of alcohol fuel, and components must be modified to deal with higher corrosion. Major car manufacturers have over 5 million Flex Fuel Vehicles (FFV's) on the road today which can "switch" from gasoline to alcohol, but up till now the lack of pumps (only one in California!) and shortage of the fuel, which recently replaced MTBE as an additive, has made ethanol fuel, which operates at about 80% of the efficiency of gasoline (but burns clean), a pipe dream. It shouldn't be by any means (see answers related to Brazil). **FALSE**

9. Most of those who know anything at all about hybrid electric vehicles have heard that they get better gas mileage at lower speeds. This is certainly true of some models, such as the Ford Escape small SUV, which can tool around town at low speeds on all electric mode for up to two miles before kicking in to the ICE (internal

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combustion engine). The Japanese, who have a highly dense society, first noted these benefits in city driving using the Prius. But the Honda Accord Hybrid has what's called its Integrated Motor Assist technology, whereby its nickel metal hydride house batteries, charged by forward motion and braking, boost the ICE in gaining and maintaining speed. At 75 mph, for example, forward momentum, IMA, cruise control, and the shutting down of three of its six engine cylinders, can result in its highest mileage benefits, around 37 mpg. **TRUE**

10. The technologies differ, but commercial processors such as the FuelMeister make it possible to produce biodiesel for under \$1 gallon (after capitalization costs). Ethanol stills can produce alcohol fuel for such low costs, and the "fuel" from solar panels can charge an EV or NEV for virtually pennies per gallon of gas "equivalent." All these systems can be housed in the Garage Filling Station. **TRUE**

11. Actually, there are several technical "fixes" costing well under \$5000 (in most cases) which could allow you to drive a car without gasoline. One is the biodiesel processor above, about \$3000, and the ethanol still. Another would be converting a compact or subcompact car that runs on gasoline to "all-electric," gutting the ICE and other oily components, adding a battery bank, and replacing the gas components with an electric motor, drivetrain, and electronic controls. **FALSE**

12. The Chinese USED to ride millions of bicycles from home to work etc. but are in the throes of heavy industrialization (80% of Wal-mart's products are from China), have a burgeoning middle class, and are even getting into automobile manufacturing on their own (a new electric vehicle made in China has just arrived at dealers in the United States). China is also in the process of establishing fuel efficiency standards for its new auto industry, starting at 38 mpg. It is estimated by the Earth Policy Institute that in 25 years China will require the consumption of 99 million barrels of oil a year, vastly exceeding the current world production of 84 million barrels. **FALSE**

13. Other factors include tension with oil giant Venezuela; continued supply limitations due to hurricane Katrina; loss of supplies from Iraq; and the general perception that the world is reaching the peak of its production capacity. **TRUE**

14. In graphs prepared by Colin Campbell and others, it is clear that over half of the cheapest and most readily available crude oil has already been extracted, and even if there is an equal amount of untapped crude in producing fields around the world, the logistics of obtaining it will prove challenging, and less and less will be acquired even as the price for it continues to climb. **TRUE**

15. Electricity generated from solar /photovoltaic panels is a modern marvel; the technology dates back to the mid-50's and was originally used as a source of energy for satellites. As "distributed" power it can be placed almost anywhere the sun shines on a regular basis--its only drawbacks are the limitations of battery storage technologies, which are advancing rapidly, and the distance electrons must travel. It is estimated that solar panels sited on 100 square miles of Nevada desert would easily meet the entire nation's electrical requirements. Solar panels installed at residences and commercial centers could eventually charge electric vehicles, or even provide the clean/cheap energy source to create hydrogen for fuel cell vehicles. **FALSE**

16. Amazingly, that country was Iraq. The source of this information is a story in the *Los Angeles Times*. **TRUE**

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17. Although President Bush thinks of him as a dictator, President Hugo Chavez of Venezuela would have to be considered a “benevolent” one since he is fourth among the suppliers of U.S. oil, and recently offered through his state based oil company Citgo (alone among all companies asked) a huge subsidy on fuel oil delivered to residential users in the U.S. Northwest. Citgo stations import primarily Venezuelan oil. **FALSE**

18. The tar sands in Alberta, Canada have greater oil reserves than the fields of Saudi Arabia, except that Saudi oil is easily extracted compared to the oil in the tar sands, which must be subjected to heat, washed, and then refined. It is estimated that the price of a barrel of crude oil must exceed \$20-\$25 before it becomes profitable to develop the tar sands, which is occurring on a massive scale as I write. **FALSE**

19. When crude oil, long buried deep within the ground, is burned, carbon dioxide (CO<sub>2</sub>) is released into the atmosphere, contributing to global warming. The burning of fossil fuels also helps create ozone, spews particulates, and produces carbon monoxide. When agricultural products like peanut oils (as biodiesel) and corn or wood products (as alcohol) are burned the CO<sub>2</sub> released is basically equal to that which was absorbed by the plant in growth, achieving equilibrium. Most biofuels also burn much cleaner; biodiesel does emit some nitrous oxides, which can be adjusted for in the engine. **FALSE**

20. A documentary film, *The Power of Community: How Cuba Survived Peak Oil*, reveals what happened to this island society a few miles off the coast of the United States when the USSR withdrew its subsidies and support in the early 90's under pressure from the U.S. government. Cuba essentially became a testing ground on a small scale for whether a once partially industrial society could survive the removal of oil energy across the board. Transportation initially ground to a halt, and high intensive oil-based agriculture became impossible. The Cubans, however, survived, and today may have the more “sustainable” society in the world. The main basis for their success has been a huge commitment to educating the population about all aspects of organic farming, which is now practiced by nearly everyone with even a small plot of ground. Automotive and truck transportation, which has suffered for years from lack of parts and imports under the U.S. embargo, was scaled way back, although motor vehicles continue to ply the nation's roads. A bus system was developed using large trailer trucks, among other strategies. **TRUE**

21. As of March 2005, gas prices in the Netherlands were \$6.48 a gallon and in Denmark, \$5.93 a gallon. It helps to be an oil rich nation--Venezuela's prices were 12 cents a gallon, Nigeria's 38 cents a gallon, and Kuwait 78 cents a gallon. **FALSE**

22. Brazilians have been running many of their cars with ethanol for years. It has been used in racing engines in the Indianapolis 500 for 80 years. Two individuals I know about began promoting ethanol use at least 25 years ago. David Blume developed a series on alcohol fuel for San Francisco public tv station KQED in 1983, only to have it yanked when oil interests pressured the station. Robert Warren became interested in alcohol as an alternative to petroleum in 1978 and built a “solar powered still” the same year, which he demonstrated at a Whole Earth celebration fair at UC Davis. (His still plans are “still” sold over the internet). **FALSE**

23. In practice, an electric vehicle (EV) or neighborhood electric vehicle (NEV) charged by solar panels, a wind turbine or small hydro generating facility would be completely non-polluting in the course of day to day travel. The new Air Car runs from compressed air in on board tanks that can also be filled via solar, wind or hydro power. (In addition, the vehicle filters air as it moves forward, since some of the gas can be compressed during mobility, thereby REDUCING pollution.) A nearly 100% ethanol fuel can make an internal combustion engine

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nearly pollution free, since byproducts are only water and CO<sub>2</sub>. A vehicle that runs on hydrogen gas would be pollution free as long as source of the production of the hydrogen, by electrolysis or other chemical interaction, is solar or wind energy. **FALSE**

24. Actually, U.S. automakers have missed the ball at least THREE times. In the late 50's auto sales were inexplicably slumping--consumers seemed to be tiring of the large bodied cars with chrome and tailfins--and about that time Europe began to build popular small cars like the VW Bug, Renault, English Ford, Hillman and Fiat, reducing U.S. foreign sales as well. In fact, sales of the popular Bug/Beetle, hyped by clever Madison Avenue advertising, were starting to explode, much as the hybrids are today. A long LIFE Magazine article explained this dilemma of automakers, and it was titled: "Volkswagen, Go Home! But Detroit Can't Stop Small Cars and So May Make Them." If Detroit started to make them, I am personally unaware of any popular vehicles that were able to compete with the Bug. **FALSE**

25. As optimistic as I am, very little of my research at this juncture indicates American, or world industrial society, will retool transportation away from petroleum dependencies by, say, 2035, when some experts believe we will have exhausted most of our easily available crude oil reserves. Of course, a huge escalation in the price of gasoline might force a few million people to abandon 5-10 year old or older cars, which will likely end up in third world countries desperate for any transportation options. A Caltrans estimate of what percentage of the total cars on Los Angeles streets will be hybrids by 2020 is only 2%. Yet, hybrids have the best chance of supplanting vast amounts of fossil fuel use at this point, assuming they can maintain double the average mpg of today's vehicles of around 23 mpg. (But there is already a trend toward more performance and styling, and less gas savings, in hybrids.) It makes sense to me that, while I don't believe it will be possible to discourage private car ownership anytime in the near future, the average two car owner could downscale to at least one small fueled-at-home vehicle, possibly a NEV or full size EV. A small diesel like the VW Lupo would also make sense, if fueled at home with biodiesel. Such a vehicle would not be dependent on any petroleum, and would accomplish the short driving needs of shoppers, students, and some commuters. **FALSE**