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How 'green' is 'green'?

This blog post is rooted in a discussion my husband and I had yesterday regarding a news item I ran across about a **'green' race car that runs on vegetable oil and waste chocolate**. I *get* vegetable oil, but where on earth does waste chocolate come from? Godiva, Ghirardelli, Hershey, Fannie May, and other chocolate candy companies? An admitted chocoholic, I don't understand *waste* chocolate; *waist* chocolate makes far more sense to me.

After talking about what a shame it is to use chocolate as fuel, we began talking about 'green' automotive initiatives in general. My husband's comments, courtesy of **Bill Nye, the Science Guy**, had me googling faster than an **SSC Ultimate Aero**.

My husband recently saw Nye talking on TV about the environmental hazards inherent in biofuel production. Apparently, Nye suggested that the production methods are more hazardous to the environment than the benefits of using the fuel. (Keep in mind that I have this information second-hand.) My curiosity was piqued. I want to more about these hazards and whether they negated the positive environmental impact of burning biofuel instead of gasoline.

The Good Human Web site published an article in February of this year entitled "**Are biofuels worse for the environment than oil?**" The article quoted a **Mother Jones** article that said, "Biodiesel emits less than one-quarter the carbon of regular diesel once it's burned. But when production—the destruction of ecosystems in the developing countries where most biofuel crops are grown—is factored in, many biofuels may actually emit more carbon than does petroleum, the journal *Science* reported last year. Because oil palms don't absorb as much CO₂ as the rainforest or peatlands they replace, palm oil can generate as much as 10 times more carbon than petroleum, according to the advocacy group Food First. Thanks in large part to oil palm plantation, Indonesia is now the world's third-largest emitter of CO₂, trailing only the U.S. and Canada."

In an **article** posted March 2008, The Truth About Cars Web site cited a **New York Times** report that biodiesel producers were dumping vegetable oil byproducts into local streams and rivers, harming wildlife. "The **National Biodiesel Board** claims that their members' industrial byproducts are 'nontoxic, biodegradable and suitable for sensitive environments.' Yes, well, Bruce P. Holleb, researcher with Environment Canada, says the result is some bad shit for birds and fish. 'As with most organic materials, oil and glycerin deplete the oxygen content of water very quickly, and that will suffocate fish and other organisms. And for birds, a vegetable oil spill is just as deadly as a crude oil spill.'"

What about ethanol production? The Energy Justice Network has a **fact sheet about ethanol biorefineries** and purported negatives that concludes with these statements: "Many billions of dollars go to subsidizing the corn industry and ethanol production. This money could go much further if invested in the transition to conservation, efficiency, wind, and solar. The need for combustible fuels in transportation can be eliminated with the use of electric cars (and plug-in hybrids in the short term), using windpowered electricity, at a cost less than \$1/gallon gasoline equivalent.

"Increasing the average mileage of passenger cars and SUVs by 3 to 5 miles per gallon would dwarf the effects of all possible biofuel production from all sources of biomass available in the U.S. Inflating passenger car tires properly today will have more impact on the energy independence of U.S. than the 2012 ethanol production requirements."

What about the hybrids? What are the environmental effects of electric car battery production and disposal?

HowStuffWorks has a **comprehensive article about hybrid cars and pollution** that includes sections about **production pollution** and **hybrid car batteries**. The latter section says, "... increased awareness about the environmental impact vehicles and vehicle parts have on the Earth has led drivers to shift their concern from fuel efficiency to something else entirely—hybrid car batteries.

"There are three major types of batteries that companies use or are considering for use in hybrid cars: lead-acid, nickel-metal hydride (NiMH) and lithium-ion (Li-ion). By far, lead-acid is considered the most toxic of the three, and on top of that it's also extremely heavy, reducing some of the fuel efficiency gains from the electric motor. Lead-acid is becoming less of a contender in the hybrid car battery market and is being replaced by nickel-metal hydride. Nickel is less toxic than lead, but it's not without its own problems—it's potentially carcinogenic and the mining process is considered hazardous. Since they're the least toxic, many consider lithium-ion batteries to be the next step for hybrid car batteries. In fact, car companies are investing millions of dollars in research for a working hybrid car battery that

uses the same kind of power currently found in laptops and MP3 players."

The most positive thing I took from my research sparked by my husband's Science Guy comment was that many if not all of the environmental problems associated with these alternative technologies for powering automobiles are known, discussed, and addressed. And automakers are being scrutinized to make sure that their claims of producing 'green' vehicles hold pollutant-free water. Just yesterday, a blogger on TheGreenCarWebsite.co.uk questioned Toyota's manufacturing processes in, "**Can Toyota really claim to be green?**" The blogger concluded, "If we accept that the manufacturing process from all vehicle manufacturers has its faults, but that Toyota is among the greenest, then perhaps the focus should be on the end result—and the Toyota Prius is significantly greener than the conventional cars that are manufactured in a similar way and will do more harm to the environment over their lifetime.

"Of course there may be greener alternatives in the future—electrics and fuel cell cars for example, when the infrastructure is in place—but for now hybrid cars remain the most realistic alternative for most. It would be wrong to use their manufacturing as an excuse to stick with the norm and keep on gas guzzling."

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