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August 13, 2007

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## Scientists debate ethanol's benefits

BY JIM WAYMER  
FLORIDA TODAY

They're pitched as cleaner and greener, but ethanol cars may be meaner on the lungs, recent research shows.

Converting America's cars and trucks from gasoline to ethanol might not cut smog at all, or could slightly worsen it, according to a study at Stanford University.

"This is part of the misinformation campaign that's caught on," said Mark Jacobson, an atmospheric scientist at Stanford and author of the study. "It's a hope more than anything."

Jacobson used a computer model to predict the effects of a large-scale ethanol conversion on pollution and death rates from respiratory illness in 2020.

"Both gasoline and ethanol are going to kill at least 10,000 people" per year, Jacobson said.

But his model, published in the April issue of Environmental Science & Technology journal, predicted that Los Angeles, for one, could expect 650 more hospitalizations and 1,200 more asthma-related emergency visits in 2020 if many more ethanol cars and trucks take to America's roadways. The effect would be the same whether the ethanol is from corn, switchgrass or other plant products, he said.

Tailpipes of ethanol cars spew formaldehyde, acetaldehyde and other pollutants and could in some areas create more ozone, all of which can damage lungs.

Formaldehyde, a byproduct of combustion, is a lung irritant and a carcinogen. It is also found in smoke from cigarettes, wildfires and car exhaust. Acetaldehyde, also a lung irritant and carcinogen, is best known as the breakdown compound from alcohol that causes hangovers -- and is actually more toxic than the alcohol itself.

Ethanol advocates counter that Jacobson's is just one study and that the fuel should be a vital piece in diversifying America's energy sources. They point to studies that show ethanol can reduce other emissions such as carbon monoxide, total hydrocarbons and nitrogen oxides.

Florida's Technological Research and Development Authority, based in Melbourne, helped secure \$250,000 in state and federal grants to build four ethanol pumps in Brevard in recent years: two at Kennedy Space Center and one each at the two Air Force bases.

"Clearly we're going to have to broaden our portfolio of usable transportation fuel," TRDA deputy director Dave Kershaw said in defense of ethanol.

"Everything I've read said it burns cleaner than gasoline. It may not be as efficient. It is renewable. It's got a high octane."

The pumps had originally been intended for public access, Kershaw said, until the 9-11 terrorist attacks led to increased security concerns.

Scientists aren't sure, however, that a large-scale ethanol conversion would be the best route to energy independence. Beyond potential ozone increases, it could mean more fertilizer runoff, habitat destruction and less farmland for feeding people.

"There is really, honestly, a big question of whether this thing is going to be worth it," said Ali

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### Less than gas

A nationwide survey by the U.S. Department of Energy in February and March found ethanol was on average about 20 cents less per gallon compared to gasoline.

- Ethanol \$2.10 per gallon
- Gas \$2.30 per gallon But a gallon of ethanol produces less energy than a gallon of gasoline. So on an energy-equivalent basis, ethanol costs another 66 cents per gallon on average.
- Ethanol \$2.96 per gallon
- Gas \$2.30 per gallon -- **Clean Cities Alternative Fuel Report, March 2007 (U.S. Department of Energy)**

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Raissi, director of advanced energy technologies division of the Solar Energy Center in Cocoa, which focuses on hydrogen fuel cell research.

"Using foodstuff to make ethanol makes absolutely no sense," he said.

Jacobson says hydrogen fuel cell cars or electric battery-powered cars that rely on wind power, solar and other renewable sources would be much cleaner.


An entire American fleet fueled by wind would require about 122,000 five-megawatt wind turbines, he said.

Land for wind turbines would be about one-thirtieth that needed to grow enough corn to fuel all vehicles with ethanol, Jacobson said.

And carbon dioxide reduction would be about 50 times more per vehicle.

Air pollution deaths would drop to almost zero, compared with about 10,000 deaths per year from gasoline and corn ethanol, he said.

**Contact Waymer at 242-3663 or [jwaymer@floridatoday.com](mailto:jwaymer@floridatoday.com).**

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many of those big rigs are burning biodiesel which can also be purchased locally.

Posted by: **twinter** on Mon Aug 13, 2007 7:38 pm

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Floridaman, thanks for the info. Very interesting, did you notice the percentage of 'lost energy'? Holy crapola!  
 Yep, a good chunk of our power plants use coal, which right now is about the dirtiest way to do it. If our scientists could find a way to burn coal cleanly, that would go a long way to resolve our pollution issues.  
 Also, I still believe that the transportation industry (airlines, trucking, rail) emit way more pollution (diesel fumes) than all the cars put together.  
 Have you seen the show on Discovery, Ice Road Truckers? What a sight, thousands of big rigs & construction machines burning diesel 24/7 'cause if they get turned off they'll freeze!

Posted by: **motrhedmike** on Mon Aug 13, 2007 1:43 pm

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