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INSIGHT

By Ed Wallace

Ethanol: A Tragedy in 3 Acts

Amid the current panic about gas prices many people are embracing ethanol. But that's not such a good idea

During the comment period for the RFG (reformulated gas) program, supporters of ethanol had argued that the volatile organic compound (VOC) emission standards in the program -- 42 U. S. C. 7545 (k) (3) (B) (i) -- would preclude the use of ethanol in RFG because adding ethanol to gasoline increases its volatility and raises VOC emissions, especially in the summertime.

Background

The American Petroleum Institute v. the U.S. Environmental Protection Agency [Docket #94-1502 (Heard by the U. S. Court of Appeals for the District of Columbia Circuit and decided on April 28, 1995)]

If there were ever a time when the truth in advertising standards should be put back into place, it's now -- during the current (third) attempt to convince the public that the massive use of corn-derived ethanol in our gasoline supply will alleviate our need for foreign oil. Ultimately, the answer to just one question determines ethanol's actual usefulness as a gasoline extender: "If the government hadn't mandated this product, would it survive in a free market?" Doubtful -- but the misinformation superhighway has been rerouted to convince the public its energy salvation is at hand.

Act I, Scenes 1 and 2

The use of ethanol to reduce our dependence on foreign oil is nothing new. We also considered it during our nation's Project Independence in 1974, the year after the first Arab oil embargo. After the second energy crisis in 1979, an income tax credit of 40 cents per gallon of 190-proof ethanol produced was instituted as an incentive for refiners of ethanol to blend this product into gasoline.

Because this federal largesse now existed, within five years, 163 ethanol plants had been built -- but only 74 of them were still in operation. As gasoline availability opened up in the 1980s and gas prices went down, many ethanol plants simply went out of business.

Shortly thereafter, in yet another attempt to broaden the product's usage, Congress enacted a law that allowed car manufacturers to take excess mileage credits on any vehicle they built that was capable of burning an 85% blend of ethanol, better known as E85. General Motors (**GM**) took advantage of the credits, building relatively large volumes of the Suburban as a certified E85 vehicle. Although in real life that generation of the Suburban got less than 15 mpg, the credits it earned GM against its Corporate Average Fuel Economy (CAFE) ratings meant that on paper, the Suburban delivered more than 29 mpg.

Other manufacturers also built E85-capable vehicles -- one such car was the Ford (**F**) Taurus. Congress may have intended simply to create a market for this particular fuel by having these vehicles available for sale. But what the excess mileage credits actually did was save Detroit millions each year in penalties it would have owed for not meeting the CAFE regulations' mileage standards.

Act II, Scenes 1 and 2

In the mid-'90s the Clean Air Act of 1990 kicked in, mandating that a reformulated gasoline be sold in the nation's smoggiest cities. So the Clinton Administration again tried to create an ethanol industry in America, by having the Environmental Protection Agency mandate that fully 30% of the oxygenates to be used in gasoline under that program come from a renewable source. But members of the American Petroleum Institute had already geared up for the production of Methyl Tertiary Butyl Ether (MTBE), their oxygenate of choice. The ensuing lawsuit was argued before the Court of Appeals for the District of Columbia on February 16, 1995.

The EPA took the position that it had been given a mandate to find ways to conserve the nation's fossil-fuel reserves, so it needed a renewable fuel -- and ethanol neatly fit that bill. But there were problems with that argument, not least of which was the fact that the judges could find no charter or mandate from Congress that gave the EPA the statutory right to do anything about fossil fuel, reserves or otherwise.

Even more damaging, the EPA's own attorney admitted to the judges that because of its higher volatility, putting ethanol into the nation's fuel supply would likely increase smog where it was used. One of the judges, on hearing that the EPA was actively promoting a substance that could in fact diminish air quality, wondered aloud, "Is the EPA in outer space?"

The final decision favored the American Petroleum Institute. The judges agreed that the EPA was bound by law only to promote items that would improve air quality -- not to reverse the nation's advances in smog reduction. That decision was apparently forgotten with record speed. In the summer of 2000, ethanol as an additive was mandated for the upper Midwest,

including the city of Chicago and parts of the state of Wisconsin.

Act II, Scenes 3 and 4

After Asian economies had collapsed in the late '90s, the price of oil had fallen to as low as \$10 a barrel. Gasoline was selling in many parts of the U.S. for as little as 99 cents a gallon. But by 2000, the per-barrel price had risen to \$32, and gas was averaging \$1.55 a gallon nationally. As they are today, the nation's drivers were incensed by the rising prices of gasoline and oil. And then reformulated gasoline made with ethanol hit Chicago and points north. Gas prices there suddenly soared over \$2.00, with a few stations selling their product for as much as \$2.54 per gallon.

At some stations in southeast Wisconsin, where reformulated gasoline wasn't required and gas cost considerably less, pumps ran dry in the panic, as savvy consumers topped off their tanks. Citing the Lundberg Survey, the Associated Press on June 12, 2000, stated, "Dealers in the Midwest, where many cities use a reformulated gas blended with the corn derivative ethanol, are paying a premium at wholesale."

Just a few months later, Brazil -- which had worked toward energy independence since the mid-'70s oil crisis and had already mandated that the percentage of ethanol in its fuel be raised to 24% -- was forced to import ethanol refined by the Archer Daniels Midland Co. ([ADM](#)) when the nation's sugar-cane crop suffered a devastating drought. Brazil understood that a year of poor crops was just as damaging to its national fuel supply as Iran taking its oil off-market would be to the rest of the world.

Then came the third act in this ethanol play -- and possibly the most misleading and disingenuous PR campaign ever.

Act III: Cue the Fact-Checker

It started with Congress, which mandated that even more ethanol be used to extend the nation's fuel supply. From General Motors, an ad campaign called "Live Green, Go Yellow" gave America the impression that by purchasing GM vehicles capable of using E85 ethanol, we could help reduce our dependence on foreign oil.

What GM left out of its ads was that the use of this fuel would likely increase the amount of smog during the summer months (as the EPA's own attorneys had admitted in 1995) -- and that using E85 in GM products would lower their fuel efficiency by as much as 25%. (*USA Today* recently reported that the Energy Dept. estimated the drop in mileage at 40%.)

But one final setup for the public has gone unnoticed. At the Web site, www.fueleconomy.gov, which confirms the 25% to 30% drop in mileage resulting from the use of this blended fuel, another feature lets users calculate and compare annual fuel costs using regular gasoline to costs using E85.

But the government site's automatic calculations are based on E85 selling for 37 cents per gallon less than regular gasoline, when the *USA Today* article reports that at many stations in the Midwest E85 is actually selling for 13 cents per gallon more than ordinary gas. Using the corrected prices for both gasoline and E85, the annual cost of fueling GM's Suburban goes from \$2,709 to \$3,763. Hence the suggestion that truth in advertising should come back into play. Possibly GM could rename this ad campaign "Shell Out Green, Turn Yellow."

Epilogue: Get this Wasteful Show Off the Road

The other negative aspect of this inefficient fuel is that numerous studies have found that ethanol creates less energy than is required to make it. Other studies have found that ethanol creates "slightly" more energy than is used in its production. Yet not one of these studies takes into account that when E85 is used, the vehicle's fuel efficiency drops by at least 25% -- and possibly by as much as 40%. Using any of the accredited studies as a baseline in an energy-efficiency equation, ethanol when used as a fuel is a net energy waste.

Furthermore, no one has even considered the severe disruption in the nation's fuel distribution that mandating a move into ethanol would cause. Over the past month, gas stations from Dallas to Philadelphia and parts of Massachusetts have had their tanks run dry due to a lack of ethanol to blend. The newswires have been filled with stories bemoaning the shortage of trucks, drivers, railcars, and barges to ship the product. Ethanol can't be blended at refineries and pumped through the nation's gasoline pipelines.

The recent price spikes for gasoline have forcibly reminded the people of Chicago and Wisconsin of what happened when ethanol was forced on them during the summer of 2000. Moreover, the promise of energy independence that Brazil has explored through ethanol is widely misunderstood. Recently a Brazilian official, commenting on our third and most recent attempted conversion to ethanol, said that when Brazil tried using agricultural crops for ethanol, it achieved only a 1:1.20 energy conversion rate, too low to be worth the effort.

FINAL BOW? On the other hand, ethanol from sugar cane delivered 1:8 energy conversion, which met the national mandate. Unfortunately for us, sugar cane isn't a viable crop in the climate of our nation's heartland. But the part of Brazil's quest for energy independence that the media usually overlooks is that ethanol wasn't the only fuel source the country was working on: Its other, more important, thrust was to find more oil. To that end, last week Brazil's P50 offshore oil platform was turned on. Its anticipated daily output is high enough to make Brazil totally oil independent.

More smog, infinitely worse gas mileage, huge problems in distribution, and skyrocketing prices for gasoline. Maybe now that we're witnessing the third act in America's ethanol play, the upcoming epilogue will close this show forever. Even great advertising works only if the product does.

A Note from the Author

To the Readers of BusinessWeek Online

I honestly appreciate the rapid and varied responses to my column on ethanol.

Rest assured, I am not in the pay of an oil company, nor has any oil company ever paid to sponsor my five-hour radio show in the Dallas Fort Worth area. In fact, my many writings and discussions on the current problems with the price of oil and gas have brought me numerous complaints from oil companies.

That said, I want to respond to some of your concerns.

1. With all respect, I have a problem with the idea that "good journalism" is reporting both sides of the story and "letting the readers or viewers decide." Sadly, because so many practice that -- however unevenly -- everyone's left wondering what is the real story is behind an issue. The whole concept is why today so many important issues are wrapped in obfuscation.
2. You think I "have no problem paying \$3+ per gallon for gas." Well, knowing the price of gas could be somewhat lower, paying that much does bother me, a lot. But I'm much more concerned about the average family in this country, raising kids; I worry that the current price of gasoline puts a burden on them that the budget can't stand for much longer. But this assertion misses the entire point of my column: If you don't like paying \$3 a gallon for gasoline, then use E85 where available -- and your effective costs for fuel, because of the dramatically reduced gas mileage you'll get, will make that \$3 per gallon more like \$4.
3. I don't believe the concept that Big Oil is "scapegoating ethanol to protect their market share" is accurate. According to my research on the subject, some oil investments cost upward of \$5 billion or more. If there were a natural and viable market for ethanol, one would think that any oil company, rather than investing in large offshore platforms that are prone to hurricane damage, or doing business in regions of the world with known terrorist problems, would be better off simply buying millions of acres of farmland and growing ethanol crops to use in their fuel. Particularly as today there is a 51-cent-per-gallon direct tax credit on each gallon refined. Obviously, that would go a long way toward eliminating their federal taxes completely; so the very fact that oil companies don't grow or refine ethanol leads one to believe it might not be a good business model.
4. I thank the gentleman who wrote saying I was the first to mention that ethanol has the potential to create more smog due to its higher volatility. I've long had a problem with the description of reformulated gasoline as a "cleaner burning fuel." Then again, the one source I for that fact that I cite in the article is the EPA's own attorneys, who were arguing their case before one of our Court of Appeals.
5. As for the gentleman who suggested that there is room for choices in fuels, I could not agree more. We should do more research to make that a reality.
6. On the subject of which study was done that either proves or disproves the energy equation on ethanol, I've read both Dr. Pimental's papers and the more recent one by Alexander Farrell. The later paper suggests that ethanol is slightly positive on the energy scale, but Farrell points out that this is partially because of the byproducts from the process, from which one should subtract the energy used for those salable products. It doesn't change the fact that once ethanol is used in gasoline, the vehicle's fuel efficiency dives. Farrell also believes that the real answer for ethanol is cellulosic technology. The President mentioned that exact same thing in his State of the Union Address, days after Farrell's paper was published. (We have been working on this issue since Project Independence in 1974, and we still haven't found a way to refine ethanol by using cellulosic technology in any sort of cost effective manner. However, should that technological breakthrough happen, I am capable of reversing my position -- but future technology is not the issue I addressed this week.)
7. I feel I did present both sides of the controversy: I cited two studies and two conclusions -- and then added that Brazil's 31-year quest for energy independence had created an ethanol market. But nothing is going to change one fact: Use the E85 ethanol blend; if you think you're paying too much for fuel now, watch what your bills jump to then. (Or even with the 10% drop in mileage you get with less ethanol in the gasoline.)
8. While I have no proof on this comment concerning Bill Gate's investment, one would think that the 51-cent per gallon direct tax credit would be a strong reason to move into ethanol.
9. Finally, as for some who suggest that Peak Oil is around the corner, maybe not. In Dr. Hubert's time, the commonly held view was that the world started with 2 trillion barrels of recoverable oil. In the late nineties, the United States Geological Survey put that number closer to 3 trillion barrels. Now the head of Shell Canada has suggested that the Canadian Tar Sands holds 2 trillion recoverable barrels. Add into that mix the fact that the Rand Corporation released a study last August that claims the Green River Formation in Western Colorado likely has one trillion recoverable barrels and suddenly Peak Oil doesn't look like it is going to happen anytime soon. This is not to be confused with the end of cheap oil, which may well happen in our lifetime.

Thanks to everyone for caring enough about the issue to write.

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