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Addicted to Bad Data

Getting the Facts Straight on Ethanol

In his State of the Union address on January 31, 2006, President Bush declared that "America is addicted to oil" and announced a new "Advanced Energy Initiative" to increase funding for research into renewable, homegrown, alternative energy sources to power our nation. One key element of the proposal is to fund "additional research in cutting-edge methods of producing ethanol, not just from corn, but from wood chips and stalks, or switch grass. Our goal is to make this new kind of ethanol practical and competitive within six years."

This announcement came on the heels of the Energy Policy Act of 2005, which requires the United States to ramp up the amount of ethanol and other such renewable fuels mixed into the nation's fuel supply, reaching 7.5 billion gallons by 2012—roughly double the current amount. In the meantime, several technology-gurus-turned-energy-investors—such as Microsoft founder Bill Gates, 3Com Corp. founder Robert Metcalfe, and Sun Microsystems founder Vinod Khosla—have begun pouring their own money into ethanol and biofuels development, seeing it as a lucrative part of America's energy future.

Given the political complexity of the ethanol debate—bringing together powerful interests and players in energy, agriculture, and environmental policy—it should come as no surprise that the president's interest in ethanol would be closely scrutinized and even attacked. Two weeks after the State of the Union address, for example, economist Kevin Hassett wrote that "in a capital city that is full of shameless political scams, ethanol is perhaps the most egregious." Hassett, a resident scholar at the American Enterprise Institute, cited the government largesse that goes into the production of ethanol—"a tax credit of 51 cents per gallon of fuel ethanol" (coming to about $1.4 billion this year), plus about $4 billion to subsidize the production of corn.

These facts are not in dispute. Ethanol, like all energy sources, ben-

efits from handsome federal subsidies. But Hassett's sharpest line of attack was over the so-called "energy balance" of ethanol—that is, the difference between the energy produced by a fuel and the energy required to produce it. Hassett argued that ethanol's energy balance is negative—that ethanol actually wastes energy, belying all claims that producing the biofuel serves our environmental or national-security interests. He writes:

> A recent careful study by Cornell University's David Pimentel and the University of California at Berkeley's Tad Patzek added up all the energy consumption that goes into ethanol production. They took account of the energy it takes to build and run tractors. They added in the energy embodied in the other inputs and irrigation. They parsed out how much is used at the ethanol plant. Putting it all together, they found that it takes 29 percent more energy to make ethanol from corn than is contained in the ethanol itself.

While Hassett admits that "some other authors have disputed these findings," he says "they invariably come up with more favorable calculations by excluding some of the costs."

Well, actually, not so. Professors Pimentel and Patzek have published several studies on this subject, and these have been thoroughly and repeatedly debunked in the scientific literature, in government reports from the Department of Energy and Department of Agriculture, in congressional testimony, and elsewhere. (Much of this information is collected on the website of the Department of Energy's Alternative Fuels Data Center.) Reputable scientists have publicly called the work of Pimentel and Patzek "shoddy," "unconvincing," and lacking in basic scientific transparency. The most recent dissection of their claims, appearing in the journal *Science* in January 2006, found that their results depended upon "some input data that are old and unrepresentative of current [ethanol-production] processes, or so poorly documented that their quality cannot be evaluated."

One of the most harsh, clear, and forceful critiques of the Pimentel-Patzek studies has come from Bruce E. Dale, a professor of chemical engineering at Michigan State University. Among the many errors Dale has identified is that Pimentel's work uses figures for corn yields that are too low, and figures for the amount of energy required to produce ethanol that are too high, all because they are seriously outdated. Dale also found that Pimentel's work has wrongly assumed that all corn is irrigated when only about 15 percent of it is (resulting in exaggerated energy costs for the irrigation of ethanol-producing corn), and that Pimentel failed to assign any energy credit for the animal feed produced as a byproduct of ethanol production. Not only does Professor Dale argue that the energy balance for producing ethanol is significantly positive, but he has also pointed out that the balance of liquid fuel is enormously favorable: more than six gallons of

ethanol are produced for every gallon of gasoline or diesel fuel expended in the process. That is a much more relevant metric for ethanol policy, as Dale explained in a 2005 debate with Patzek and Pimentel hosted by the National Corn Growers Association: "We do not need energy *per se*; we need the services energy provides.... The U.S. has lots of coal and natural gas, but they don't work in the gas tank. They have the wrong energy quality."

So how could two such distinguished professors be so wrong? The answer would surely horrify Hassett had he bothered to look into the matter. Patzek, the Berkeley professor, is an accomplished geoengineer with extensive ties to the oil industry; he seems only to have been writing about biofuels for the last few years. But Pimentel, the Cornell professor emeritus, is an entomologist who has been complaining about ethanol since the early 1980s. And he's not just an opponent of ethanol production. He is also an opponent of beef production. He is a critic of the use of pesticides and opposes much of modern agriculture. He is highly critical of pet cats and dogs. He's against immigration—both legal and illegal—and ran for a position on the board of the liberal Sierra Club in 2004 on a platform calling for a halt to all immigration. (He was defeated.)

And then there are babies. Professor Pimentel believes there should be fewer of them. Far fewer. According to Pimentel, the Earth's "carrying capacity" is 2 billion people. The world's population needs an "adjustment" down to that number, he wrote in the inaugural issue of the journal *Environment, Development and Sustainability*, and he called for a "democratically determined population control policy" requiring "that each couple produces an average of 1.5 children" to make that happen by the year 2010. (The United States population, he says, should be reduced to under 200 million people.)

Politics surely makes strange bedfellows. But it's especially strange, and more than a little disappointing, to see Kevin Hassett—a pro-growth economist—quoting the discredited science of a radical Malthusian like David Pimentel. Surely, there are problems with America's ethanol subsidy program and unsettled questions about the ultimate value of ethanol compared with other potential sources of energy. But it is foolish to allow a general opposition to subsidies to morph into an anti-scientific ideology, getting seduced by shoddy data that support the claims that one wants to make anyway.

And surely the Bush energy plan is fraught with excess—both in the various projects it funds and the rhetoric ("addicted to oil") it now employs. But it is obvious that we have an energy problem—an excessive reliance on undemocratic petroleum-producing states, some of which fund terrorism—that the free market alone will not solve. Which means a little government largesse in search of new energy alternatives is perhaps a tolerable price to pay, even for a bona fide free-marketeer.