Oil Pinch Stirs Dreams of Moonshine Travel

Alcohol making is in the American grain, but farm lobby has reason for pushing gasohol

While motorists on East and West Coasts idled impatiently in line to buy gasoline, a beguiling rumor went the rounds: of a man who had converted his car to run on ethyl alcohol which he distilled from his kitchen garbage.

The story was a little too good to be true, but it represented a ground swell of hope, manifested in a rash of initiatives by the White House and Congress last month, that native-grown alcohol can somehow help support the national addiction to the automobile and reduce dependence on foreign oil.

Scott Sklar directs the Washington office of the National Center for Appropriate Technology. Before that he was an aide to Senator Jacob Javits for 10 years. Oil company skepticism about alcohol as a fuel, Sklar says, made him determined to find out for himself. Talking to farmers who had run their tractors on alcohol during the Depression, he learned that converting an engine to alcohol was easy. For about $12 in parts, Sklar 8 months ago converted his 1964 Rambler Classic to run on pure alcohol. It drives fine and does 22 miles to the gallon, he says, compared with the 20 miles it used to do on gasoline.

The only catch is the alcohol. Sklar has experimented with stills, but it is hard to get them to work on a small scale. He has to buy his alcohol from a gasohol dealer—for $1.25 a gallon.

Gasohol, now being sold in the United States as a mixture of 90 percent gasoline and 10 percent ethyl alcohol, is the form in which proponents of alcohol fuels place their most immediate hopes. It can be used in existing cars without any modification to the engine. General Motors gave its seal of approval to gasohol on 2 May by announcing that its warranty coverage would still apply to cars using gasohol instead of gasoline.

Some powerful political interests have converged in support of gasohol. Proponents argue that there is already enough surplus wheat, corn, and distressed crops to distill some 10 billion gallons of fuel alcohol a year. National consumption of gasoline is 110 billion gallons; selling it all in the form of gasohol would reduce imports of foreign oil, improve the U.S. balance of trade, raise farm income, do away with grain surpluses, save the taxpayer billions of dollars in farm subsidies, and help convert the nation from fossil to renewable sources of energy. "Let the sunshine make your moonshine," is the lighthearted slogan of the fuel alcohol movement.

Alcohol can be made from the cellulose in wood chips and urban trash. It can be made from the carbohydrates in the by-products of the cheese and corn sweetener industries. Or it can be made directly from grains grown specially for the alcohol distillery. It is the third choice that arouses the strongest political passions.

With record surpluses of corn on hand, farm interests in Congress are urging that the government, instead of paying farmers to hold land out of production, should instead encourage maximum planting and channel the surplus into alcohol fuel distilleries.

Spearheading the effort is Representative Berkley Bedell (D–Iowa), who has a bill that would lend $600 million for building alcohol fermentation plants. The money would come from the savings made by not paying farmers to set aside land, a program which for feedgrains cost the taxpayer $512 million in 1978.

The scheme has undeniable appeal. So why does even the Department of Agriculture oppose it? "Those guys just have tunnel vision down there," says a Bedell aide. "They don't understand the ability of farmers to produce a hell of a lot more if only farming was made profitable."

It's not that simple. Economists at midwestern universities have made no friends for saying so, but the economics of fermenting corn to fuel alcohol make no sense at all under almost any foreseeable price conditions that do not include a hefty federal subsidy.

Worse still, the net energy balance is negative, given the oil and gas usage of present distilleries. It takes more oil to produce the corn and ferment it into alcohol than is saved by using the alcohol as fuel. Using agricultural wastes, such as corn stover, as the distilleries' source of heat, would at best be a break-even process in energy terms.

Becoming dependent on corn as a source of fuel would only buy future grief: In years of bad harvests in a hungry world, a decision would be forced between food for people and fuel for cars.

The natural fluctuations in the price of corn could be economically devastating for those who had invested in alcohol distilleries, Secretary of Agriculture Bob Bergland explained to the House Science and Technology committee on 4 May.

"There does not now appear to be a need to grow additional crops for alcohol production," Department of Energy official Alvin L. Alm told members of the House Agriculture committee considering Bedell's bill on 16 May.

These counterarguments are nothing new to the farm lobby. The country boys in Congress are riding the gasohol bandwagon only to take their city cousins for another ride. The cost competitiveness or otherwise of alcohol is beside the point. The real issue is the price of corn. The rule of thumb in Iowa is that a 1 percent decrease in corn supply raises corn prices by 2 percent. If you could divert some 500 bushels of corn (from the normal yearly production of 6 billion bushels) into the alcohol distilleries that you had induced the federal government to finance, you could raise the price of corn by roughly one-sixth. The city dwellers would be paying more for their corn and more for their uncompetitive, tax-subsidized gasohol, but the farmers in Iowa would be laughing all the way to the bank.

Making common cause with those concerned about the energy crisis, the farm lobby in Congress has already pressured the Administration to create a range of incentives for gasohol. The Department of Agriculture is increasing its research on alcohol fuels by $4 million, and has lent $30 million to build two pilot plants for fuel alcohol production. In a speech given in Des Moines, Iowa, on 5 April, President Carter promised $11 million to help farmers build 100 small-scale alcohol fuel plants.

More important than any of these initiatives was an amendment to the 1978 Energy Tax Bill which exempted gasohol from the 4 cents per gallon federal fuel tax for a 5-year period. Backed mostly by senators from farm states, the exemption amounts to 40 cents per gallon of alcohol when used to make gasohol with a 10 percent alcohol content.

So potent is the tax incentive that it has now drawn into production almost all the unused capacity in the nation's distilleries and industrial alcohol plants. Almost overnight, a market has been created for gasohol. The number of gas

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stations marketing gasohol has grown from a handful a year ago to more than 700. President Carter told Iowans he would support a permanent extension of the tax exemption.

Iowans themselves have gone one better. They have exempted gasohol from state taxes of 6.5 cents a gallon. As a result, gasohol sales in Iowa in March this year amounted to 2.5 percent of the state's gasoline sales.

The state's tax exemption, however, brings the total tax subsidy to $44 per barrel of alcohol. To some economists that seems a high price to pay to avoid buying a $16 barrel of Arab oil.

The gasohol market doubtless merits incentives to get started, particularly since gasoline benefits from the oil depletion allowance and other advantages. Even if converting corn to alcohol makes no sense outside Iowa, other kinds of source material may prove more practical in time as the price of oil increases. Grain-carbohydrate fermentation has been fairly well explored; better potential for breakthroughs in production economics may lie in cellulose, an avenue that would draw upon forestry by-products and municipal wastes as a vast source of feedstock. Columnist Jack Anderson is vexed that the Carter Administration "has largely ignored our appeals" for a crash gasohol program and that "the oil industry has opposed them." Gulf Oil, however, has been experimenting with a cellulose to ethyl alcohol program since 1971. "It was our decision to stay away from the food chain. Food is a basic human energy need that supersedes all other energy needs," Gulf official George F. Huff told the House Science and Technology committee on 4 May. Gulf's process depends on enzymes to break down the cellulose (acid breakdown, the alternative, causes environmental disposal problems). The raw material is municipal waste, supplemented with paper-mill waste, sugarcane bagasse, or cotton gin trash, depending on what is locally available. If the demonstration plant proves successful, Gulf plans to invest $112 million in a plant that would produce 50 million gallons of alcohol a year from a daily input of 2000 tons of cellulosic waste. The alcohol will sell at $1.45 a gallon in 1983 (today's prices range from $1.20 to $1.50), giving Gulf a commercially viable process that yields a 15 percent return on investment.

If the 4 percent federal tax exemption is made permanent, alcohol fuel production from all biological material (excluding food or feed grains) could reach 600 million gallons a year by 1985, the Department of Energy estimates. This is a drop in the bucket which the national appetite requires. The alcohol would substitute for 40,000 barrels of petroleum a day. Provided that minimal amounts of petroleum were used in its manufacture, the alcohol would reduce petroleum imports by up to 0.4 percent.

That is no big help. But from the grass roots sentiment in favor of alcohol fuel, perhaps some new development will emerge to brighten the Department of Energy's forecast. As proponents will tell you at the drop of a hat, Henry Ford built the Model T with an adjustable carburetor so that it could run on alcohol, gasoline, or any mixture of the two. The conversion of biomass to ethanol is a national folk art hallowed by tradition if not by law. New research, according to biofuel enthusiast Sklar, has made clear why federal agents could never trace the illegal grain shipments from which they supposed Al Capone distilled the liquor supply for his fellow Chicagoans: Capone's feedstock came from a source over which he had better control—the city's garbage. Carter doubtless had something else in mind when he went to Des Moines and praised the forgotten old time uses and production of alcohol as "a classic example of American ingenuity."—NICHOLAS WADE

Brown Down on Weapons Link

The issue of University of California management of the Livermore and Los Alamos nuclear weapons laboratories came to a boil at a UC regents meeting on 18 May when Governor Jerry Brown, a regent, introduced a motion that would end university involvement in weapons work.

Action on the proposal was put over until the regents July meeting, but Brown's initiative moved the regents to the center of the stage in a growing debate over UC management of the labs (*Science*, 18 May).

Brown's motion would direct UC president David S. Saxon to terminate the university's management of the weapons labs, but left the way open for UC's continuing in the contractor's role at Livermore if that laboratory were converted entirely to nonmilitary work.

At a meeting of the regents special research projects committee the day before, Brown said that he feels that weapons laboratories doing secret work have no place in the university. He also advanced the idea that all weapons work be conducted at Los Alamos under new management.

Brown made his motion to terminate the contract at a meeting of the full regents board the next day. Action was postponed after William K. Coblentz, a San Francisco attorney, argued that there had not been enough discussion of the matter and moved to defer the issue.

The lead has been taken in the regents' scrutiny of the laboratories link by Stanley K. Sheinbaum, a Los Angeles economist and businessman. A Brown appointee to the board in 1977, Sheinbaum is vice-chairman of the regents' special research projects committee. He has informed himself on the labs matter and at the last two regents meetings has questioned the adequacy of university oversight of the laboratories.

The debate within the regents comes at a time when a regents' search committee is looking for a new chief for Los Alamos to replace long-time director Harold Agnew, who recently stepped down.

One name being mentioned as successor to Agnew is Donald M. Kerr, now acting deputy director in the Office of Energy Technology in the Department of Energy (DOE). It is understood that Kerr is favored for the post by DOE and the Department of Defense. Kerr is a former Los Alamos staff member and was an official at DOE's nuclear test site in Nevada.

The White House is said to be less than enthusiastic about the appointment since Kerr last year made public comments on the matter of testing to insure nuclear stockpile reliability which were interpreted as running counter to Administration views and were not cleared by the Administration.

The Kerr appointment is viewed as "informed speculation" at this point, in part because of impending changes in the DOE hierarchy; Kerr could be promoted within headquaters. The UC regents have formal authority to appoint lab directors on the recommendation of the university president, but DOE, which owns the labs, is consulted throughout and, historically, federal officials have had a direct role in selection.—J.W.

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