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Addiction Treatment

Bush's Latest Energy Solution,
Like its Forebears, Faces Hurdles

**Fuel from 'Cellulosic Ethanol' Is Costly, Hard to Dispense;
Broad Political Support, Enthusiasm From Detroit**

By JOHN J. FIALKA and JEFFREY BALL

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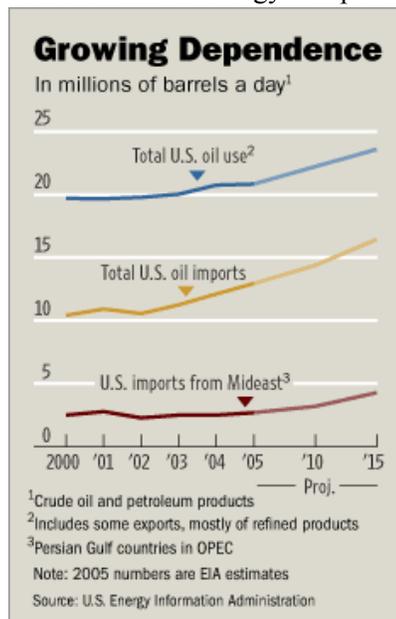
With oil prices stuck at more than \$60 a barrel, President Bush is touting "cellulosic ethanol" as a 21st-century panacea for the U.S.'s addiction to oil. In his State of the Union address Tuesday, Mr. Bush said energy made from "wood chips, stalks or switch grass" could be available at gas pumps in six years and could supply nearly a third of the fuel needed to keep Americans on the road.

The plan is the latest in a long line of promises from Washington to back new forms of alternative energy, going back to President Carter's promotion of synthetic fuels. It offers some intriguing new technology and the possibility of widespread support from environmentalists, farmers and auto makers.

Like earlier promises, most of which failed, Mr. Bush's surprise promotion of cellulosic ethanol also faces huge hurdles. For one, the budget-constrained White House is offering little money to back up its rhetoric: just \$150 million next year, hardly enough to revolutionize a multibillion dollar energy market.

The fuel also faces distribution problems and a lack of properly equipped vehicles. And an unpopular gas tax might well be needed to make ethanol a competitively priced product at the pump.

The proposal marks a switch in emphasis for a politically weakened president. The administration previously has said the route to energy independence lay in encouraging domestic oil and gas drilling, including opening the Arctic National Wildlife Refuge. Such proposals, which have repeatedly died in Congress amid bitter political wrangles, were notably absent in this year's speech.



By contrast, cellulosic ethanol can draw support from a surprisingly diverse political coalition. Scientists, investors and policy makers say it is increasingly viable to make fuel from farm waste, also known as "biomass." For one, it is cheaper than corn-based ethanol, the fuel that has been a heavily subsidized favorite in Washington. Private-sector investors -- from Virgin mogul Richard Branson to Canada's Iogen Corp. -- are putting money into the concept in hopes of seeing an ethanol boom in the U.S. similar to one in Brazil.

Environmentalists like the idea because burning the fuel doesn't pollute as much as conventional gasoline. Defense hawks, notably Reagan Secretary of State George P. Shultz and Clinton Central Intelligence Agency Director James Woolsey, promote it as a way to boost national security. Struggling U.S. auto companies like it because they have a competitive advantage over the Japanese on so-called flexible-fuel vehicles that can switch between gasoline and alternatives.

And because the fuel can be made from a wide range of agricultural products, it draws backing from a geographically diverse range of politicians, from New York Republican Gov. George Pataki to a bipartisan group of elected officials in California. The fuel is even popular in farm states such as Iowa that tout conventional corn-based ethanol, since it can make heavy use of corn stalks.

Many experts say conservation or a gas tax is the best way to dent import demand. Mr. Bush has rejected these approaches as conflicting with his free-market bent and has preferred throughout his term to focus on new drilling and new technologies. The White House estimates the president has provided \$10 billion in spending on new energy technologies since taking office in 2001.

Beyond ethanol, Mr. Bush's new "Advanced Energy Initiative" includes spending for research on hydrogen cars and hybrid-car batteries that can be recharged overnight, as well as money for solar and wind energy. His grand goal, as he stated in his national address, is "to replace more than 75% of our oil imports from the Middle East by 2025."

Significant Departure

That would mark a significant departure from the future the government now predicts. The Energy Information Administration says the U.S. will import more crude oil and finished petroleum products, not less -- more than 70% of projected oil use in 2025, compared with 62% last year. Mideast imports are expected to become more important, rising to 30% of U.S. crude-oil and refined-product imports in 2025 from 21% last year.

The EIA soon will release new data ratcheting down the expected U.S. reliance on imports, based on the rise in oil prices, which the EIA reasons will spur higher conservation and domestic production. Nonetheless, Mr. Bush's plan would mark "quite a change," says John Conti, director of the office of integrated analysis forecasting at the EIA. It is "a very aggressive goal."

John Felmy, chief economist at the American Petroleum Institute, the oil industry's main trade group, says the goal is "achievable," but not without big changes. He says it would likely require a boost in domestic drilling, a major conservation effort or an increase in U.S. oil imports from other parts of the world, none of which is under way.

Nearly half of the oil consumed by the U.S. is burned in cars and trucks. Over the years, the U.S. has debated toughening federal fuel-economy requirements, created in the mid-1970s in the wake of the Arab oil embargo. Still, the average fuel economy of cars and trucks has been flat for more than a decade. One reason: Sport-utility vehicles and pickup trucks, which Americans snapped up when gas prices were low, aren't subject to the toughest fuel standards.

Some auto makers argue that improving fuel economy won't reduce oil consumption: Consumers whose vehicles go farther on a gallon of fuel will simply drive them more.

Hence the appeal of alternative sources. One concerted effort, which ratcheted up amid high oil prices in the early 1980s, was a government-sponsored research program to convert coal into synthetic natural gas. The project succeeded in the lab but "synthetic fuel" didn't make much of a market impact after oil prices subsequently fell.

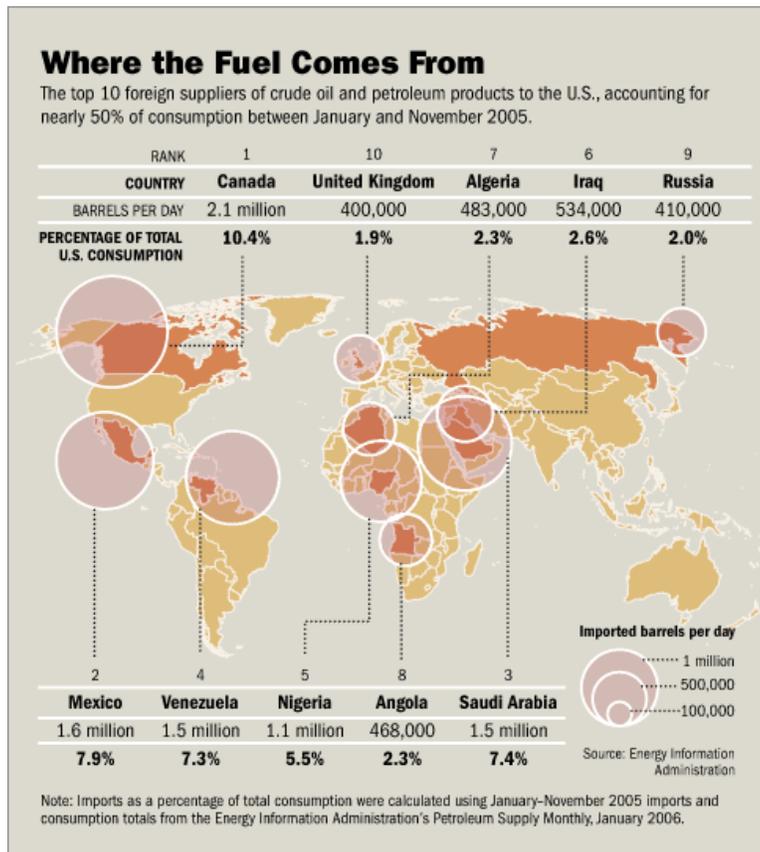
In the 1990s, the auto industry talked up the potential of battery-powered cars, largely as a way to meet clean-air regulations in California, the nation's biggest auto market. That effort fizzled in part because of the cost and difficulty of producing batteries that lasted long enough.

A few years ago, proponents began talking enthusiastically about cars that would run on fuel cells powered by hydrogen. President Bush promoted the technology in his 2003 State of the Union address. Though he still touts it, some of the euphoria has subsided. The most realistic way to produce hydrogen is from a fossil fuel -- natural gas. There also is no viable infrastructure for delivering hydrogen to filling stations.

Some vehicles run on compressed natural gas -- another fossil fuel but one that burns more cleanly than does gasoline or diesel. But it also isn't widely available at gas stations and its use is limited to fleets, such as buses and taxis, which can be refueled at central locations.

Biggest Barrier

Now comes the focus on cellulosic ethanol. The biggest barrier to its widespread use is cost. The International Energy Agency, a Paris-based energy watchdog for industrialized nations, estimates that cellulosic ethanol costs about \$3.40 a gallon to produce, according to Pierpaolo Cazzola, an IEA analyst. That is far higher than the current average U.S. price of regular, unleaded gasoline of \$2.35 a gallon, according to AAA, the motor group, and doesn't even include a markup. Other experts, however, say the cost could be lower.



Car makers periodically argue that only by raising gasoline taxes, a politically unsustainable proposal, will consumers make the switch to more fuel-efficient vehicles.

Even if ethanol costs come down, distribution remains tricky. Ethanol can be transported along existing pipelines as long as it is blended with petroleum products in concentrations of less than 10%, Mr. Cazzola says. Any more than that and ethanol can corrode pipelines. How to manage the distribution of ethanol is "a bit of debate," he says.

About five million vehicles that can use gas and ethanol are on the road now, but many of those drivers don't know their vehicles are capable of using ethanol. Only 600 filling stations offer E85, a blend of 85% ethanol and 15% gasoline, and they are mostly concentrated in the Midwest. That number could quadruple this year, but it still would be a fraction of the 170,000 fueling stations in the country. Michigan, home to the

American auto industry, has only a handful of E85 stations.

Some auto companies -- notably the Japanese, who haven't invested much in the technology -- remain cautious. [Toyota Motor](#) Corp. sells flex-fuel vehicles in Brazil, but not in the U.S. Bill Reinert, national manager of Toyota's U.S. advanced-technologies group, is skeptical of corn-based ethanol because of the huge amounts of land and water required to grow the corn. Made in large quantities, he says, cellulosic ethanol holds more promise.

Still, he has questions: How does it perform in the car? What might future production look like? What are the environmental issues associated with that production? "There's no real silver bullet out there," Mr. Reinert says. "Each fuel has its own particular problems."

A Success Story

Brazil is the main success story touted by ethanol enthusiasts -- it gets half its motor fuel from ethanol. The country's effort was launched in 1975, but ethanol in Brazil only became competitive recently after gasoline prices rose sharply. It also took years of government subsidies totaling at least \$16 billion, plus tax breaks that cost several

billion dollars more. Brazil mandated that the fuel be available at 29,000 filling stations -- a cost borne by state-run oil giant Petrobras.

Bush officials are optimistic their efforts can push the technology over the hump. The \$150 million they are seeking for the year starting Sept. 30 -- up from \$90 million this fiscal year -- would go to research on enzymes and yeast that can break down materials including wood chips and "switch grass," a grass that grows quickly without much fertilizer. The process is similar to making bootleg whiskey.

According to Doug Faulkner, acting assistant secretary for energy efficiency, the Department of Energy's researchers had a breakthrough in 2004 when they figured out how to drastically cut the cost of producing sugar from corn stalks. Now, he says, they can produce ethanol from corn waste for \$2.30 a gallon, well below the IEA estimate.

The Energy Department has received unverified reports from outside researchers that the cost could be as low as \$1.30 a gallon.

Congress last year authorized loan guarantees for companies that want to start cellulosic-ethanol plants. If the money is approved, the loans would cover as much as 80% of the cost of the first four cellulosic-ethanol plants built in the U.S., up to \$250 million each.

Officials say once production costs fall, other hurdles should disappear. "The marketplace will take care of that," Allan Hubbard, head of the White House National Economic Council, told reporters. "Once the product is available, the distribution system will respond quickly."

In the private sector, the front runner is Iogen, a closely held Ottawa company. It has attracted powerful partners, including [Royal Dutch Shell](#) PLC, to help build industrial-scale plants to produce the fuel.

'A Good Signal'

"The President's speech was a good signal," says Jeff Passmore, Iogen's executive vice president. He says the company is looking at sites in southwestern Idaho and in the Canadian provinces of Alberta and Saskatchewan for its first plants and is preparing to break ground at one of them in the summer of 2007.

Mr. Passmore said Iogen has signed contracts with 300 Idaho farmers to take 400,000 tons of their wheat and barley straw a year. The lead sponsor of the loan guarantees was Idaho Republican Sen. Larry E. Craig, who has been pushing to get Iogen to locate a plant in his state.

Mr. Bush's push for cellulosic ethanol gives a small helping hand to [General Motors](#) Corp. and [Ford Motor](#) Co., who both are suffering from significant financial woes. While Toyota has shunned ethanol, those companies see it as a way to improve their environmental image, which is tainted from pushing SUVs.

"Ethanol can provide relief for customers at the pump and lessen America's dependence on foreign oil," said Bill Ford, chairman and chief executive of Ford, in a written statement yesterday welcoming the White House initiative.

GM is spending tens of millions of dollars on an ethanol-awareness campaign: "Live Green Go Yellow." It is set for an expensive launch during Sunday's Super Bowl in both pre- and post-game advertising spots. This year, GM plans to send a letter to the one million owners of its flex-fuel vehicles, including those who might not know they run on ethanol. It will offer them a free, yellow gas cap that can be installed at their local dealer to remind drivers the car can run on ethanol.

--Karen Lundegaard in Detroit, David Luhnow in Mexico City and Bhushan Bahree in Vienna contributed to this article