

BACON'S REBELLION

The Op/Ed Page for Virginia's New Economy

One Man's Trash...

...is another man's energy-rich biomass. Warrenton Mayor George Fitch views the county landfill as the key to energy independence.

By James A. Bacon

The idea sounds so outrageous that one is tempted to dub it Fitch's Folly. George Fitch, the promotional genius behind the Jamaican bobsled team, the tax-cutting mayor of Warrenton and the erstwhile 2005 Republican candidate for governor, has set a new goal for himself: to make his town of some 5,000 inhabitants "energy independent" within the near future.

Warrenton has no source of coal, oil or natural gas. It has no special hydroelectric potential. It is blessed with no surfeit of sunlight to power photovoltaics, no cornucopia of corn to convert to ethanol, no bounty of breezes to run wind turbines. No, this picturesque burg set amidst the rolling hills and horse farms of Fauquier County, has nothing that thousands of other small towns dotting the American countryside have. Nothing, that is, but the restless, creative energy of George Fitch.

Fitch wants to create ethanol and generate electricity using biomass as a feedstock and fuel. What kind of biomass? All kinds. The waste that goes into the county landfill. Tree clippings from forest maintenance. Corn husks and switch grass. Wooden construction debris. Old tires. Sewage sludge. Virtually any organic waste that can be rounded up from within a 20- to 25-mile distance from town that

other people would let rot or, better, pay to get rid of.

After extensive research -- a parade of alternate-energy experts has been filing in and out of Warrenton -- Fitch has conceptualized a project that would cost about \$30 million. It would generate about five megawatts of electricity for sale into the electric grid, enough to power about 5,500 households, and would yield 10 million gallons a year of ethanol. As long as the price of ethanol stays above \$1.25 a gallon (it's about \$2.25 right now) and the price of crude stays above \$38 per barrel (it's over \$60), he says, the project will be profitable.



"I'm a fiscal conservative," says Fitch. "Government shouldn't be wasting peoples' money. We have a landfill. We're taking garbage and burying it in the ground." That just doesn't make sense, he contends, when the garbage is loaded with BTUs that can be converted into electricity and liquid fuel.

Fitch is working to "tee up" the project, ensure a reliable supply of biomass feedstock, find a private-sector operator to take ownership, and lobby for federal loan guarantees to reduce the risk for investors. His goal is to negotiate terms that would allow him to re-sell the electricity to Warrenton residents for about half of what Dominion charges.

"If my residents are paying 5.9 per kilowatt to Dominion," he says, "let's bring that down to three cents."

The biomass project is part of a larger energy-independence program. Much like Arlington County, which recently launched an initiative to reduce greenhouse gas emissions, Fitch also is exploring "green buildings, LEED certification, an energy audit to establish a carbon footprint baseline, and the capture of the methane gas from the sewage treatment plant. But as green as it is, Arlington isn't making its own ethanol and electricity.

The gasification technology is well understood, although the engineering probably will need tweaking to accommodate the wide range of waste products that Fitch contemplates. As the mayor describes it, the process entails heating the waste materials to an extremely high temperature in the absence of oxygen -- as high as 2,000 degrees -- and then cooling it to 98 degrees. The material would not burn, it would gasify, leaving about two percent of the original volume as residue to dispose of. Waste heat from the cooling would be used to generate electricity, while the organic compounds in the gases would be converted into ethanol.

If the Warrenton project pans out, Fitch sees the idea spreading nationally. U.S. energy policy has focused mainly on large-scale ethanol plants that convert corn. "They're overlooking the most significant player in the space, and that's local communities," he says. "There are

thousands of communities scattered across the United States with waste in their back yards."

There are implications for Virginia energy policy, too. The environmental community is pushing a Renewable Portfolio Standards bill that would require Virginia electric utilities to generate 12 percent of their power from renewable energy sources by 2020. Although the legislation has been side-tracked while the General Assembly takes up re-regulation of the electric power industry, the issue is not likely to go away. (See "Voltage Hogs," March 5, 2007.) Municipal projects built around local landfills across the state could make a significant contribution to that 12-percent goal.

Environmentalists like renewable fuels like wind, solar, geothermal and biomass because they don't pollute. Renewables have an economic edge, too: The "fuel" is essentially free. In the case of biomass, people actually pay to dispose of it. That provides rate-payers protection against rising fuel prices.

Small-scale projects like the one Fitch proposes also are consistent with a "distributed generation" approach to organizing the electric power grid. In theory, an electric grid consisting of many small producers located close to their consumers is more stable and less vulnerable to disruptive blackouts than a system depending upon massive power plants linked by equally giant transmission lines.

"If you drop in a five-megawatt plant and flow the power into the distribution grid, there's a range of benefits," says Brad Schneider, founder of Recovered Energy Resources, a Rappahannock County company that designs biomass-to-energy plants, who has advised Fitch. Balanc-

ing the grid with locally generated electricity affects the harmonics and stability of the system. "That allows [the power company] to actually put more power through existing lines they have in place -- without adding any new equipment, without new cable."

For Warrenton and the northern piedmont, grid harmonics are no small thing. Dominion wants to run a transmission line through the region in order to wheel more electricity from the Midwest into Northern Virginia. Not only would a Warrenton power plant increase the supply of locally generated electricity, a better load balance in the region might enable the power company to increase the capacity of existing transmission lines.

Fitch got excited about the potential for biofuels after attending a state energy conference in Lexington. Since then, he's discussed the idea with a number of companies and university professors with competing gasification technologies. He's had conversations with oil giant Chevron, which wants to get into the field. He's even chatted with John Deere, which is developing machinery that reaps grain and stalks in a single sweep, then separates the stalks for use as an ethanol feedstock, about partnering on the project.

The next phase of the project is finding \$300,000 for design and engineering. That's more than Warrenton can afford, but Uncle Sam is handing out renewable-energy grants like bingo cards in an old folks home. Fitch thinks he has a shot at getting support. His argument: A successful demonstration of the technology in Warrenton could open up opportunities for municipalities across the country.

Fitch insists that his project

would stand on its own merits. But as gravy for investors, there is a host of credits and incentives. There's a \$.51-cent-a-gallon credit for ethanol, plus an extra \$.10-a-gallon for small producers. There's a credit of 1.5 cents per kilowatt hour for producers of "green" electricity, and \$20 per ton for using agricultural/forest residue to produce energy. A loan guarantee from the federal government would eliminate any remaining risk for private investors.

"Biomass is the largest source of renewable energy right now after hydro. The trick is getting financing for the first project," demonstrating an unproven technology, says Mary Bacon, a partner with Ewing Bemiss who specializes in financing renewable energy projects. (Yes, she *is* related -- she's my sister.) The economics of wood waste have been attractive for a long time. Cow manure is a proven source of power -- if you can get enough of it. She's even raising money now for a company that wants to convert sewage sludge into fuel. "There's a lot of money trying to find deals. It can all happen. I think it will."

Also working in Fitch's favor: The Kaine administration is eager to support renewable fuels in Virginia. Although the Commonwealth has limited resources to devote to the sector, it can function as an intermediary between entrepreneurs like Fitch, academic resources and market opportunities. Dr. Y.H. Percival Zhang at Virginia Tech, for instance, has developed a promising biochemical process to convert cellulosic material (wood waste, corn stalks, switch grass) into ethanol in small-scale biorefineries. Meanwhile, the Department of Mines, Minerals and Energy has spotted some potentially large ethanol customers in the state -- the oil refinery in

Yorktown is one, military bases are another -- that local vendors could sell to.

Fitch is bursting with enthusiasm at the potential for his project. He thinks he's got all the angles covered, although he's wise enough to temper his comments with a note of caution: "There's a huge caveat. Like most things new, you go through a trial-and-error process. You go up the learning curve."

An outside observer like Mary Bacon thinks he has a realistic shot at success. "I applaud him. What he's doing is terrific," she says. "If he's realistic about his time frame, he can be successful."

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