EDITORIAL

When Change Happens

John H. Perkins

One of the most challenging tasks faced by professionals and their associations lies in developing methods and tools for their work that accommodate changes in technology, which in turn changes environmental impacts, the economy, politics, and policy. Just as military generals commonly know best how to fight the last war but not the current one, professionals have the best methods for assessing well-established industries, not those emerging.

To illustrate, let's examine the workings of one ethanol distillery, in one small town, in one small county, in one not-very-big Midwestern state. I'll leave the plant anonymous in order to highlight the general situation rather than focus attention on a specific, real company. All of the information cited here is easily available on Internet sites, so secrecy of commercial data doesn't hinder the inquiry.

This distillery, which I'll call "Sunshine Energy," began operations recently. It sucks in corn, water, and coal and spits out about 140,000 gallons per day of ethanol when all is working well. In addition to the ethanol, Sunshine Energy also produces about 400 tons per day of dried distillers' grains, generally called DDGs. Railcars and trucks whisk the ethanol off to gasoline formulators, who usually mix it as E10, or 10% ethanol and 90% gasoline. The DDGs go to livestock producers for feed.

Now consider some of the quantitative features of Sunshine. In order to get 140,000 gallons per day, or about 50 million gallons per year, the distillery annually uses 150 million gallons of water, 75,000 tons of coal, and about 15 million bushels of corn. Grain comes in on large trucks, about 60 per day, each of which empties between 40,000 and 50,000 pounds of corn into receiving bins in a matter of minutes.

These numbers are not just an exercise to inspire awe about the size of Sunshine's operations, but they enable us to gain some context. Sunshine's county has about 175,000 acres planted in corn each year, and the distillery now consumes the produce of about 47% of that land, or 82,250 acres. To put this matter more starkly, if Sunshine were joined by a sister plant of similar size, the two of them would consume nearly all of the corn currently produced in the county.

In other words, Sunshine Energy has reordered the use of land and other natural resources in its county. Much of the land that previously raised corn for livestock, food, and other products now produces ethanol plus the DDGs. The amount of livestock feed in the DDGs is less than one-third of the feed in the original corn. Between 10% and 20% of America's corn crop is now headed each year for the distillery.

Not only is the use of land reordered, these distilleries significantly alter the flow of money in the county. Sunshine had sales of $65.8 million in 2006 and earned a net income of $11.5 million. To the joy of any MBA and all stockholders, the return on investors' equity was an eye-popping 36.6%. Yes, Sunshine is risky and investors could lose everything. But if they have only three years like 2006, they will have made their investment money back.

Put these cash flows into context. About 43% of the equity investment came from Sunshine's county. Each shareholder will receive, in dividends, $2,000 for each share owned (a 20% return). This means that shareholders in the county will receive about $2.7 million in dividends. Per capita in the county, this sum equals about $200.

In some wealthy urban areas, this kind of infusion of money would elicit ho-hums. Sunshine's county, however, has a per-capita income about 7% below that of the United States as a whole, and an extra $200 per head coming into the county raised the per-capita income by about 1%. For a family of four, this amounts to about $800 per year, a sum that begins to make a difference.

To be sure, the income from Sunshine's dividends was not evenly spread around the county. Shareholders received the entire dividend, and we have no information on whether they spent their funds in the county or not. Nevertheless, Sunshine Energy brought significant new amounts of money into the county, just from the profits involved in the sale of ethanol and DDGs.

In addition to the type of money Sunshine and other distilleries bring in, consider what the ethanol industry has done to the price of corn. For most of the years in the last half century, corn has hovered around $2 per bushel. Starting in 2006, however, the price jumped to around $3 per bushel, with some spikes going over $4. Most observers attribute the jump to demand created by ethanol distilleries.

Sunshine's county, in 2005, produced 32.4 million bushels of corn, so at the new prices of $3 per bushel, the potential of an extra $32.4 million comes into the county just from the sale of corn. For the county, this sum reaches over $2,300 per capita. Again, it's not distributed equally, but the aggregate sum coming in will make a difference.

In real life, of course, things sometimes get more complicated. Long-term contracts, diminution of farm subsidy payments, and other factors probably mean the actual new money coming in will be somewhat less than $32.4 million. Nevertheless, the ethanol industry in general has altered the economic landscape around Sunshine Energy to a very significant degree.

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As large as these changes are, we have every reason to expect more. Farmers, seeing the highest prices for corn in 50 years, may decide to grow more of it. They may intensify their operations with more fertilizer, more pesticides, and higher yielding varieties. They may drop the traditional rotation with soybeans in favor of corn after corn. They may have marginal land in the Conservation Reserve Program that they will soon put back into corn. And farmers with more cash in their pockets may build more ethanol plants.

Change will also occur outside the farm sector. How will livestock producers react to the higher corn prices? Will American consumers soon face significantly higher prices for meat, dairy, and egg products? Will the recent protests over rising tortilla prices in Mexico—likely induced by ethanol—harm consumers in other countries? And how will Mexican corn growers, who may have been harmed by the North American Free Trade Agreement (NAFTA), react to the price rise? Maybe small growers in Mexico will find economic salvation through the high prices induced by insatiable American driving habits.

Without too much of a stretch of imagination, Sunshine Energy is a cathedral in the industrial landscape of its county, its state, and indeed its whole world. It is part of a force that orders life both physically and economically. It probably also plays a significant role in the political life of the area, but I have no information on that at the moment.

Given that Sunshine and the aggregate effects of its industry affect its county profoundly, the question becomes, "How can we best understand the individual and cumulative impacts of the new ethanol industry?" Unfortunately, here environmental professionals have no easy method or tool to help consultants, investors, owners, private firms, farmers, governments, universities, and the public assess the environmental and social impacts.

A lack of appropriate methods and tools to evaluate the environmental effects of the ethanol industry appears in similar forms, as professionals confront just about all new industries whistling down the road toward us. Life is changing rapidly with new technology, and usually we have little way to comprehend, monitor, measure, assess, and understand what is afoot. Even when the change looks good, we still have little sense of how to recognize unintended bad consequences.

That said, I believe ethanol is a road we should travel. After all, the price of doing nothing about our current energy situation invites catastrophe. At the same time, whenever possible, environmental professionals need to take leading roles in the design and use of novel methods for assessing new situations.

To say the future of a livable earth depends on this is an understatement!

Address correspondence to John H. Perkins, The Evergreen State College, Olympia, WA 98505; (fax) 360-867-5430; (e-mail) perkinsj@evergreen.edu.