

Two Companies, Two Different Blueprints for Reducing Global Warming

2008-07-25

Businesspeople spend too much time worrying about the burdens brought by global warming -- the possibility of carbon taxes and greater regulation of emissions -- and ignoring the potential commercial upside, according to participants in a recent Wharton conference titled, 'Winners and Losers in Green Technologies,' sponsored by the William and Phyllis Mack Center for Technological Innovation.

Indeed, the participants added, the so-called "green economy" presents lucrative opportunities for companies willing to invest the effort in seizing them.

These opportunities aren't just the obvious ones like solar and wind power or electric cars, but rather touch nearly every industry and every type of firm, from startups to established giants. Even organizations whose goods and services aren't easily modified can remake their images in ways that attract environmentally conscious customers or stave off competition from greener upstarts. Executives from DuPont, the Wilmington, Del., chemical maker, and NetJets, a Woodbridge, N.J.-based seller of ownership shares in private jets, talked about "going green" during a conference presentation.

Yet such optimism does not suggest that reducing a company's environmental impact is a simple task: Bringing about change will demand new approaches, and firms that fail to adapt will fall behind, several conference speakers noted. But the green economy won't solely benefit rich outfits such as Google, which is investing heavily in environmentally friendly technologies. Even more than money, going green will demand that companies rework their approach to innovation, according to conference presenter Ian MacMillan, who directs Wharton's Sol C. Snider Entrepreneurial Research Center. The payoff is that by taking the right steps, companies can make money even as they are reducing their environmental impact.

If anything, cash sometimes impedes clear, practical thinking about innovation, said MacMillan. Firms confuse lavishing money on a problem with solving it, and end up with little to show except high R&D expenditures.

To demonstrate this, MacMillan compiled a list of the top 50 R&D spenders in the United States from 1990 to 2003 and computed their relative price-earnings ratios. (A relative PE is the ratio of a firm's PE to the average PE of the market.) Two-thirds of the big spenders had lower than average relative PEs. Investors, in other words, believed these particular companies were worth less than the average company.

Critics of MacMillan's analysis might suggest that total R&D spending speaks to nothing except a firm's size. Trouble-plagued General Motors, for example, remains a hefty R&D spender, but its spending doesn't necessarily augur a promising future. To address this concern, MacMillan also calculated R&D spending as a percentage of sales -- in other words, he controlled for company size -- and still found that the market didn't reward investments in R&D. Half of these firms had lower than average relative PEs.

"We can complain about the market being short-sighted," he noted. "But if you can make a better return investing in a coffee shop than you can investing in a new semiconductor fabrication plant, people are going to invest in coffee shops. The market speaks with its feet." Government incentives like tax breaks and grants have also shown relatively little return in the green technology field, he said. "My message is that the same old, same old won't work. You have to think about innovation in terms of options reasoning. When you have high technological and high market uncertainty, you want to use options reasoning to scout for future opportunities."

Failing Early and Cheaply

Aspiring innovators, he said, should create a portfolio of small investments, often on the periphery of their current markets. They should use these investments as experiments, gather data and define clear milestones at which to assess that data. Based on what they learn, they should scrap the unpromising projects early -- that is, they should fail early and cheaply -- and redouble their commitment to promising ones. On top of this, they should forge partnerships and joint ventures with other firms to reduce the risk and cost of innovating.

DuPont, which has collaborated with MacMillan, has taken this approach. Its executives decided several years ago that, given their company's history as an innovator, it should strive to put itself at the forefront of the green economy. As a chemical maker, it had deep expertise in biochemistry and biotechnology, so it gravitated to biofuels. Biofuels, as their name implies, employ biological products like grains and other plant matter as their raw material rather than crude oil.

After assessing a raft of possibilities, DuPont chose to pursue ethanol made from cellulose, which comes from the cell walls of plants, rather than from grains like corn, said John Ranieri, vice president and general manager of DuPont Bio-Based Materials' energy and specialties division. Corn-based ethanol -- the main kind produced in the United States -- has been blamed lately for driving up food prices. Cellulose-derived ethanol, in contrast, can be made from agricultural waste like corn stalks and wheat straw.

But making ethanol from cellulose requires an extra step. "You have to turn those nonfood materials into sugar and then convert that to ethanol," Ranieri noted. "We can do it today, but it's not economically feasible [on a large scale]. So our challenge was to engineer a microbe that would digest the sugars and turn them into fuel -- and do it economically."

To reduce its risk, DuPont teamed up with Danisco, a Danish producer of enzymes and food ingredients. Their 50/50 joint venture aims to produce cellulose-based ethanol in commercial quantities by 2012. "If we hit our research targets, we are going to have a low-cost solution from a nonfood renewable source. And this is without government subsidies. That's the ultimate goal -- a low-cost solution that doesn't require long-term subsidies."

DuPont's ethanol technology, like many new technologies, will require government support as it is being introduced to the market. But even that could change if, as many people expect, the U.S. and other Western governments impose carbon-emissions taxes. "We have to figure out how to get the cost of carbon internalized in the price of energy," Ranieri noted. "If we do that, we wouldn't need subsidies for new fuels."

True to MacMillan's options approach, DuPont isn't betting only on cellulose-based ethanol. It's also trying to cheaply produce butanol -- a four-carbon alcohol produced through fermentation -- on a commercial scale. Butanol, although much more expensive to make than ethanol, has the potential to revolutionize the fuels market because it can be easily distributed through the existing petroleum infrastructure. Ethanol can't travel through pipelines and must be carried by truck or train. Butanol also has higher energy content than ethanol and mixes better with gasoline. "If we hit the economics, butanol transforms the market," Ranieri said.

Ranieri called himself an optimist about global warming, saying he believes that companies and policymakers will rise to the challenge it presents. "We at DuPont look at global warming like the ozone hole over the Antarctica." Scientists identified a hole in the earth's protective ozone gas layer in the 1970s and blamed chlorofluorocarbons, a chemical in aerosol sprays, for causing it. "That hole really galvanized people to solve the CFC problem, and within 10 years, CFCs were gone. With policies that drive good behavior, we can do the same thing with global warming."

Playboys and Plutocrats

Achieving this goal will require a major reduction in the use of fossil fuels. With current technologies, that presents a serious problem for private aviation companies like NetJets. Simply put, flying in a private jet causes more carbon pollution, per capita, than any other form of travel.

Executives at NetJets realized this and decided that they wanted to offer their customers a way to mitigate the environmental impact of their flights, said Steve Zacks, the company's chief marketing officer. Just as important, they wanted to head off future government mandates. By responding promptly to global warming, they hoped to show that regulators didn't need to impose additional rules and restrictions on their industry, he added.

NetJets' challenge was formidable. Although the company is not as well-known as commercial airlines like Southwest or United, it has extensive operations. It manages 750 jets, based in the United States, Europe and the Middle East. Its customers buy fractional shares and, on relatively short notice, can schedule flights wherever they want to go. "You tell us when you want to leave and where you're going, and we handle everything else -- from pilots to maintenance to insurance," Zacks said. "As a customer, you have access to our entire fleet."

NetJets' managers knew that private aviation would be an easy target when regulators started to seek places to cut carbon emissions. Relatively few people can afford to travel this way, and those who do sometimes inspire envy. Although many of NetJets' customers fly for business, an image of playboys and plutocrats clings to private jets.

"We wanted to be responsible, and we didn't want to stand back and wait to be called," Zacks said. "At the same time, our customers are used to being in control, and private aviation is about freedom and control. So we didn't want to put too many rules on them." Like DuPont, NetJets, which created fractional jet ownership, also saw itself as an innovator and wanted to continue that legacy.

NetJets teamed up with Esty Environmental Partners, a Massachusetts-based consultancy, to design a broad-based program to reduce its emissions and communicate with its customers and the public about its environmental values. George Favaloro, Esty's managing director, headed the effort. "NetJets had to change the way it did business and to cut its emissions wherever it could in the short run," Favaloro said. "It also had to show that it was contributing to the long-run solution for global warming." Like DuPont, it chose to take a portfolio approach, combining a variety of steps, rather than betting on just one.

Most critically, it began to offer its customers carbon offsets. With an offset, the buyer pays an intermediary to offset his pollution. The intermediary pools the buyer's money with cash from other customers and then invests the funds in pollution-reducing activities like wind and solar power and even planting trees. "With offsets, for every unit of carbon emissions that you put into the atmosphere, you're eliminating or offsetting it somewhere else," Favaloro explained. "The beauty of offsetting is that the atmosphere doesn't care where you take the carbon out."

NetJets decided to make its offsets voluntary, customers wouldn't have to buy them. But the offsets will become a mandatory part of its European contracts when customers there renew. For the moment, European regulators are ahead of their U.S. counterparts in regulating carbon emissions, which is why NetJets decided to go ahead and require offsets there. NetJets expects to be carbon neutral in Europe by 2012, with its customers' offsets completely compensating for the emissions that their flights produce, Favaloro said.

Because the United States is still in the early stages of the global-warming discussion, NetJets executives believed that they couldn't require offsetting in the U.S. without annoying customers. But even with the voluntary program, they have seen respectable demand. About 7% of customers have signed up, compared with about 1% to 3% in the early stages of the average voluntary offset program, Favaloro said.

NetJets expects that number to grow substantially as environmental consciousness increases in the United States. Its optimism stems partly from the relatively low price of its offsets. They cost about "\$25 an hour for a small jet and \$60 to \$65 an hour for a larger one," Favaloro said. "To put that in perspective, private jet flight costs about \$5,000 to \$6,000 an hour, so it's less than one percent of the cost."

Zacks added that the company has been low-key in its promotion of its offsets. But as more customers learn of the program, he expects that they will sign up. "We have to be considerate in how we communicate with our customers. These are people with lots of demands on their attention and time, and they expect that we're not going to bother them. Plus, some of our clients come to us through corporations, and they are tricky to communicate with. A lot of our communication doesn't get to the person who's using and benefiting from the service."

In addition to offsetting, NetJets is also investing in research on cleaner jet fuel and has entered into an agreement to help equip California schools with solar panels.

All of these steps, taken together, have positioned NetJets as a leader in its industry in the effort to fight global warming, according to Favaloro. "NetJets has demonstrated an intention to be on the solution side, not the problem side, of global warming. It's blunted the possibility of media and political attacks. And it's put itself on a long-term path to lower emissions."

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