VALUES

Walden Asset Management ❁ Investing for Social Change Since 1975

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In This Issue

Walden Asset Management

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BP's Emerald City

It is often hard, even for the most skilled in reviewing companies' social and environmental reports, to know where the rhetoric ends and a company's true commitment begins. No company is more difficult to understand than BP, which, has time and again, lifted up, and let down, the hopes of social investors. Commonly characterized as the "best practice" standard bearer of the integrated oil companies, the recent spate of negative news about BP has called that assessment into question.

Disappointing Performance

Oil companies, by the nature of their business, face significant social and environmental challenges. In addition, there is little publicly available information relating to social and environmental concerns outside of the U.S. and Europe. As a result, comparing one company to another from a social perspective is difficult. While many areas of concern exist, we are able to evaluate BP and its peers using only a limited range of available indicators.

Nonetheless, we are concerned by the litany of reports about negligence and mismanagement at BP. The actions attributed to the company are egregious: Fifteen workers killed at a refinery explosion in Texas in 2005, caused by (in BP's words) "significant deficiencies in the work and safety culture"; significant fines for safety violations at an Ohio refinery; alleged price fixing in BP's propane trading operations; oil spills from inadequately tested and maintained Alaska North Slope pipelines. Further allegations include oil and gasoline price-fixing and corrupt practices at the Alyeska Company, which operates the Trans-Alaska Pipeline System, of which BP is the majority shareholder. Operational difficulties such as delays at the Gulf of Mexico deepwater oil rig, Thunderhorse, also raise concerns about BP's management systems.

Meredith Benton is a Research Associate.

Walden considers a range of environmental metrics, such as a company's toxic releases, to be indicators of the effectiveness of a company's environmental management program. The Environmental Protection Agency (EPA) collects data on U.S. refineries in the Toxics Release Inventory (TRI). The TRI displays the total quantities of toxic chemicals that are released at facilities over the course of the year, both planned and accidental. Walden has compared the toxic releases on a per-barrel-of-throughput basis from BP's refineries to those of Chevron, ConocoPhillips, ExxonMobil, and Sunoco. Based on 2004 data, BP's total releases from its refineries are significantly higher than its peers (see chart, page 6). We are in discussions with BP to determine if this may be a result of inaccurately reported data from its Texas City refinery.

Additional analysis of 2003 data from the EPA's Biennial Reporting System, which tracks hazardous waste generation, shows BP's hazardous waste, on a per-barrel-of-throughput basis to comprise more than 30 times the sum of the total contamination produced by the other four companies. We

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ETHANOL: MOTOR FUEL OF THE FUTURE?

In a recent research report, Wall Street firm Goldman Sachs noted: “Many investors are understandably concerned that ethanol is nothing more than a politically motivated, media-hyped, high oil price-inspired fad.” Many on Main Street share these thoughts. Does ethanol represent *more* than federal subsidies to the corn belt? At certain prices for corn and oil, most likely.

Corn-based ethanol will not replace gasoline, but it may help keep gasoline and oil prices in check. If, as happened during the summer of 2006, oil prices rise over $65 per barrel and corn prices remain at $2 per bushel, ethanol is economical, even without subsidies from Uncle Sam. Improvements in the efficiency of ethanol refineries, and a switch to more economical and environmentally preferable feedstocks, will likely improve its competitiveness further.

Ken Scott is a Portfolio Manager and Securities Analyst.

What is Ethanol?

Ethanol is a gasoline additive or an alternative motor fuel derived from corn or other plants. There are 105 ethanol refineries in the U.S., producing ethanol at a rate of 4.6 billion gallons per year, or 3% of total motor fuel produced. Another 44 ethanol refineries are planned or under construction. These refineries remove the starch from the grain (corn), ferment it, and then distill the alcohol (ethanol) from process water. Almost all U.S. ethanol production is being blended into E10 vehicle fuel, also known as gasohol, (10% ethanol, 90% gasoline), while a significantly smaller amount is blended into E85 (85% ethanol, 15% gasoline). Ethanol is blended into approximately 40% of all U.S. gasoline, as E10, according to the American Petroleum Institute.

Environmental and Regulatory Drivers

Combustion of E10 can reduce vehicle tailpipe emissions of greenhouse gases, carbon monoxide, and, at least in certain seasons, smog-forming pollutants, by more than ten percent. The Energy Policy Act of 2005 mandates that 7.5 billion gallons of ethanol and biodiesel be blended into gasoline by 2012, up from 4.2 billion gallons in 2005. In addition, the U.S. government removed liability protection for an ethanol alternative, fuel additive MTBE, that has contaminated groundwater in a number of states. At least 20 states have full or partial MTBE bans. Thus, most gasoline refiners are now blending ethanol into fuel to meet environmental demands.

Economics of Ethanol

E85 was competitive with gasoline during the summer of 2006, even without federal assistance, according to Walden’s analysis. While the operating costs of ethanol plants are significantly higher than those of oil refineries, corn feedstock was priced much lower than crude oil, on an energy equivalent basis, in July and August 2006. Ethanol’s competitiveness was improved by a federal tax credit of $0.51 per gallon of ethanol for energy companies that blend it into their fuels.

Should we all purchase flexible fuel vehicles and use E85? Not quite yet.

The commodity markets are volatile. Ethanol prices have dropped by $1 per gallon in the past month, along with crude oil and gasoline, while corn prices have risen by 50%. Based on current oil and corn prices, and adjusting for ethanol’s lower efficiency (gallon for gallon, the heat content of ethanol is approximately two-thirds that of gasoline), our analysis shows ethanol remaining competitive only as long as the federal blending credit stays in place. Given a poor corn crop this year, the futures price of corn is significantly higher than current prices, indicating additional challenges ahead for ethanol.

Corn Ethanol’s Energy Balance

A significant criticism of ethanol has been a reportedly “negative energy value”: that it takes more energy to make ethanol than is

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About Walden Asset Management

Walden Asset Management is the socially responsive investment division of Boston Trust & Investment Management Company. Walden began offering socially responsive investment services in 1975. We are among the largest and most experienced investment managers specializing in services for individual and institutional investors with social concerns.

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THE VERMONT COMMUNITY LOAN FUND

community development investing

Founded in 1987, the Vermont Community Loan Fund (VCLF) helps Vermonters and those inspired by Vermont to put their money to work in the Green Mountain State year-round. Over the last 20 years, the Loan Fund has put nearly $42 million into the local economy building and rehabilitating homes, growing vibrant local businesses and quality jobs, creating desperately-needed child care, and supporting community-based organizations.

Let's take a look at just one year in the life of the Loan Fund….

Farm Manager Charlie Rowland works with the wet seed extractor at High Mowing Seeds.

Autumn: Harvest Season

The leaves are off the trees, the frost is on the pumpkins, and the smoke curling from chimneys offers a tell-tale sign of a change in the season. At Anjali Farm in South Londonderry, the farm stand that the Loan Fund helped to build overflows with the year's harvest, as well as jams, chutneys, and honey to preserve a bit of summer for the colder months.

Of course, autumn's arrival doesn't signal the end of every crop's growing season. Crisp red apples from Champlain Orchards are turned into heavenly pies to warm winter's table at Vermont Mystic Pie Company in Stowe. VCLF made a loan as part of Vermont Mystic's startup, paying for the manufacturing equipment that has allowed the company to achieve national distribution in hundreds of supermarkets.

Winter: Let It Snow!

Preparations for the holidays are well underway at Michael's Toys in downtown Rutland. Thanks to a working capital loan from VCLF, wooden trains and trucks will find their way into the delighted hands of children come the holidays.

Up on the sometimes-frozen shores of Lake Champlain, Burlington's Outdoor Gear Exchange is full of shoppers buying the skis, snowshoes, and cold weather gear and clothing that'll get them through 'til spring. All 27 employees receive full health and dental benefits, receive employer contributions to a retirement account, and share in Outdoor Gear's profits at the end of every year. VCLF is proud to be a part of their success.

Spring: Colds, Mud and (Organic!) Crocuses

We've all had it—the dreaded spring cold. Deep in northeastern Vermont, Valley Health Clinic serves around 2,500 Vermonters annually, most of them elderly or lower-income. The clinic's VCLF line of credit helps it provide essential health care services in this remote and predominantly low-income corner of the state.

Every spring, farmers and gardeners all over the country begin to pore over catalogs from High Mowing Seeds of Wolcott, dreaming of ripe heirloom tomatoes and six-foot-tall hollyhocks. Widely recognized as one of the few organic seed providers in the U. S., High Mowing used its VCLF loan to manage cash flow in this highly seasonal industry. With 11 quality jobs, High Mowing is one of the largest employers in the area.

Summer: Cool Indoors, Fun Outdoors!

In Winooski, seniors at Chittenden Housing Corporation's Courtyard apartments enjoy a pleasant indoor temperature even on summer's hottest days, thanks to new heating and cooling systems and energy efficiency improvements. The Loan Fund helped to finance 101 new energy-efficient units of lower income senior housing in Winooski, featuring one of the highest density senior populations in the state.

Over in Cuttingsville, young boys at Night Eagle Wilderness Adventures delight in the overnight camp experience, and gain an understanding of native peoples and their relationship to the earth. Even further east, 50 children at Creative Minds Child Care in Newport begin a lesson on apples, heralding the beginning of fall…again! ◆

—J. Ide and S. Mays

Jake Ide is Director of Development and Samara Mays is Marketing and Communications Manager at VCLF. For more information, visit www.investinvermont.org. or contact Jake Ide at (802) 223-4423.

Through our Community Development Investment Service, Walden clients have invested in numerous community development banks, credit unions, and loan funds. We are pleased to include Vermont Community Loan Fund in this service.

SOCIAL RESEARCH AND ADVOCACY IN ACTION

Investor concern about excessive executive compensation remains pronounced, most recently fueled by media attention to the questionable dating of stock option awards for executives and ongoing evidence of stagnant wage growth for the average American. Walden continues to press companies and policymakers to improve performance in these and other areas.

In 2007, new Securities and Exchange Commission (SEC) disclosure rules will require proxy statements to contain additional information on executive compensation, which should help bring clarity and transparency to how senior officers are rewarded. Still, investors have little opportunity to communicate their satisfaction, or lack thereof, with executives' compensation packages. To help address this concern, Walden has written to dozens of our portfolio companies to ask that shareholders be given the opportunity to cast an advisory vote on the compensation report for executives. Based on a similar practice in the United Kingdom, this approach would allow investors an opportunity to provide feedback on executive compensation policy. We have heard back from several companies willing to study the proposal. For example, CEO Rueben Mark of **Colgate Palmolive** reported to us that the idea was raised with the board of directors, and that the company plans to survey its largest investors for additional input.

Heidi Soumerai is Director of Social Research.

A Walden resolution requesting a comprehensive sustainability report from food distributor **SYSCO Corporation** was withdrawn in August. Despite its stated commitment to sustainable agriculture, along with other environmental and social goals, there is currently scant information on SYSCO's policies and practices with which to measure the company's progress. However, SYSCO has agreed to publish a comprehensive sustainability report on its web site, a draft outline of which has been shared with Walden. SYSCO has also agreed to ongoing dialogue with shareholders and to continuously improve its sustainability reporting.

We met in New York with **BP** CEO Lord John Browne, BP America President Robert Malone, other senior BP executives, and a small group of investors to discuss the recent accidents, spills, and alleged pricing abuses that have plagued the energy company over the past year. Browne affirmed the seriousness of the events and highlighted several operational and management changes, stating that the company needed to address the many problems honestly and directly. Because of BP's unique and constructive position in the climate change debate, its unusual level of engagement and responsiveness, and its importance to client portfolios, Walden remains committed to investment in and engagement with BP. (See related cover story.)

The dialogue with **Microsoft** on Internet freedom of expression has also continued. In addition to its new blog policy announced early in the year, Microsoft has taken steps to inform users in China of state-mandated censor activity. For example, users receive notice when content is omitted from searches or when sites have been removed from the search index. Along with others, Walden will continue to advocate for additional reforms.

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HUMAN RIGHTS IN THE SUDAN

The tragic and ongoing genocide perpetuated by the government of Sudan is drawing growing international attention and alarm. The escalation of violence that began in 2003 is increasingly prompting nongovernmental organizations, academic institutions, states and municipalities to call for divestment from companies doing business in Sudan as a means to pressure the government to stop the murder, brutality, and displacement of innocent civilians. In September, for example, California Governor Arnold Schwarzenegger signed a divestment bill governing his state's public pension funds, thus joining New Jersey, Illinois, Oregon, Maine, and Connecticut in legislating state divestment plans.

Consistent with our human rights guidelines, Walden will not invest in companies believed to provide significant support to the government of Sudan. Since 1997 when the U.S. government identified Sudan as a state that sponsors terrorism, U.S. firms have been prohibited from operating in the country. Therefore, nearly all companies commonly identified as divestment candidates are foreign based. Nonetheless, there is a sizable international corporate presence in Sudan. In the oil industry, for example, where estimates point to as much as 80 percent of revenue going to fund arms purchases, there is rising pressure to divest holdings of market leaders such as PetroChina.

For more information visit The Sudan Divestment Task Force Web site at www.SudanDivestment.org.

Significant Company News

These words, in a report co-authored by **Chubb**'s Chief Risk Officer (CRO), were unimaginable four years ago when we first began to talk with the company about climate change:

> …The sheer magnitude of climate change could in future impact a large number of industries to such an extent that sustainable insurability may ultimately be put into question. This raises important issues for society as a whole and might require adaptation measures such as public-private partnerships and, of course, adequate public actions on climate change issues. (*CRObriefing: Emerging Risk Initiative – Position Paper*, June 2006).

This statement represents a marked departure from the response to Walden's early efforts to engage Chubb on climate change. Then, Chubb had suggested that the issue was largely irrelevant to its business. Now, this industry brief indicates that insurance companies are beginning to speak out with one voice in favor of actively addressing climate change—a welcome development.

In October, **PepsiCo** promoted its chief financial officer, Indra Nooyi, to the top job and corner office, replacing retiring CEO Steven Reinemund. Nooyi becomes one of just 11 women to head Fortune 500 companies, positive news in a time of stagnant progress in breaking the glass ceiling at the highest corporate echelons.

Lobbying and Strange Company

It comes as no surprise that the Voting Rights Act (VRA)—which protects the rights of minority voters and was passed in July—was backed by the usual civil rights groups and liberal advocates. It may be a surprise to some, however, that support from more than 10 major company executives provided significant clout to help overcome objections raised by a group of conservative Republicans. It is highly unusual for CEOs to lobby for social reforms that are indirectly related to their business, yet **AT&T**, **Coca-Cola**, **PepsiCo**, **Verizon** and **Wal-Mart** were among the companies urging Congress to pass the VRA. Their reasons were many and varied, but several saw their support as an expression of commitment to workplace diversity. Here's how Chairman Lee Scott of Wal-Mart put it:

> Wal-Mart is the largest private employer of African-Americans and Hispanics and we, therefore, have a particular interest in this issue. On behalf of them as well as our millions of customers whose lives are touched by this landmark statute, we believe it is important to move forward expeditiously.

While cynics may write this off as self-serving rhetoric, we should not dismiss the importance of the corporate voice in issues of social policy. We are glad to recognize these companies for their role in the passage of VRA. ◆

—H. Soumerai

Proxy Voting Report

By September of each year, as mandated by the Securities and Exchange Commission (SEC) since 2003, mutual fund companies publish their proxy voting records for the previous year ending June 30. These disclosures have confirmed what shareholder advocates already suspected to be true: that mutual funds, representing about 25 percent of total assets, overwhelmingly support management's proxy recommendations. A leading corporate governance research firm, The Corporate Library, found that the most prominent mutual funds voted with management 92 percent of the time for the year ending June 30, 2005. Moreover, only 30 percent of shareholder resolutions were supported. This indicates a level of faith in management that we believe runs counter to the best interests of shareholders.

How does Walden compare? In reviewing the votes of a representative portfolio, the Walden Social Equity Fund, about one third of votes were cast against the recommendation of management for the 12 months ending June 30, 2006. This includes Walden's support of about 90 percent of shareholder-sponsored resolutions, which generally are not favored by management. At 17 percent of companies, Walden withheld votes for one or more directors because of diversity, independence, or accountability concerns. Auditor ratification and incentive stock plans were two significant areas of disagreement with management proposals. Walden did not support ratification if more than 25 percent of auditor revenue was derived from non-audit work (a conflict of interest concern); nor did it support incentive plans that were not aligned sufficiently with shareholder interests.

On the flip side, what accounts for our high level of support for shareholder resolutions? The simple answer is that the vast majority of the proposals encouraged good governance policies or better disclosure. Three issues accounted for most of the shareholder resolutions supported: majority vote policy for directors, political contributions disclosure, and compensation policies and disclosure. Other issues appearing on three or more ballots included equal employment opportunity policies and reports, international labor and vendor standards, and requests to separate the positions of CEO and chair. We believe that voting for these shareholder proposals is consistent with our clients' social investment objectives *and* contributes to long term business success. ◆

BP's Emerald City

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consider the performance of these refineries to be a possible indication of a company's overall effectiveness, or lack thereof, in managing environmental concerns.

The Investment Case

Confronted with compelling evidence of average to below average performance on indicators of environmental management, what is the rationale for continuing to invest in BP? We believe the answer is threefold: portfolio diversification, BP's demonstrated strategic and public policy leadership on social and environmental issues, and management's responsiveness in addressing its serious problems.

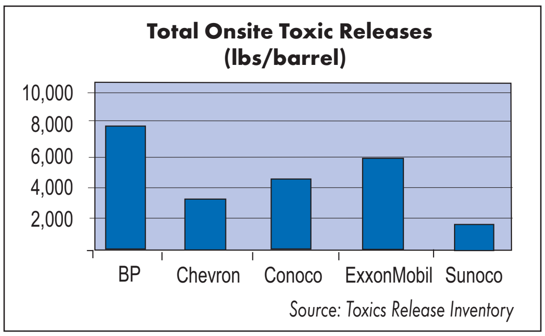
From an investment perspective, major integrated companies serve as the highest quality and lowest risk vehicle for addressing concerns over the future scarcity of petroleum and are a classic hedge against inflation. Major integrated oil and gas companies can also help reduce the investment fluctuations that arise from unexpected events in the global political economy, particularly in the Middle East. In addition, these companies share prices are less likely to decline than other energy stocks when oil prices decline. BP is among just a handful of energy companies that meet these criteria.

In the public policy arena, BP has been a champion for climate change action. In a speech at Stanford University in May, 1997, BP CEO John Browne stated:

> The time to consider the policy dimensions of climate change is not when the link between greenhouse gases and climate change is conclusively proven, but when the possibility cannot be discounted and is taken seriously by the society of which we are part. We in BP have reached that point.

This momentous statement broke BP from the ranks of the other global integrated oil companies on the issue of climate change. Its actions helped to transform the debate and to legitimize climate change as a concern for business leaders. BP has also set internal limits with respect to greenhouse gas emissions, and has incorporated emissions reductions into its long range planning for operations.

A range of other initiatives have pointed towards BP's strategic leadership on environmental concerns. BP Alternative Energy was launched in 2005, with a commitment to invest $1.8 billion over three years, split equally between solar, wind hydrogen, and combined-cycle-gas-turbine power. An additional $6.2 billion was committed to these initiatives over the next 10 years. BP is currently one of the world's largest solar manufacturers and marketers. In addition, the company committed $50 million over the next 10 years for research on biofuels. On related issues, BP was the first to market lower sulfur fuels. The company has also stepped away from the groups lobbying to open the Arctic National Wildlife Refuge on Alaska's North Slope.



In addition, BP has a number of social policies and practices that we view as superior relative to typical industry practice. The company is a participant in several voluntary global initiatives such as the United Nations Global Compact, and a signatory to the Extractive Industries Transparency Initiative, The Universal Declaration on Human Rights, and the Voluntary Principles on Security and Human Rights. BP utilizes the Global Reporting Initiative guidelines, the current highest standard in sustainability reporting, to develop its extensive reporting on its social and environmental performance.

Finally, we are somewhat reassured by the high level of responsiveness and engagement demonstrated by BP's top management. BP CEO, John Browne, CFO, Byron Grote, President of BP America, Robert Malone, and other top management met with concerned investors, including Walden's Tim Smith, in July 2006. BP replaced the management at the Texas City refinery, where the explosion occurred, as well as those responsible for the trading infractions. BP also appears to be acting to manage emerging concerns with the Trans-Alaska pipeline and its offshore operations in the Gulf.

Going Forward

We are well aware that, until new management processes take effect, there may be more disappointing news concerning BP. Repairing a poorly maintained infrastructure will take time, even under the most dedicated new leadership. BP has also, through its environmentally focused advertising campaign, "Beyond Petroleum," encouraged media interest in its environmental failings. Smaller troubles, such as a relatively minor chemical spill in Long Beach, California, that normally wouldn't make the paper, are now headline news.

Speaking with shareholders, taking responsibility for problems when they occur, being involved in beneficial public policy work, and giving credence to major global environmental challenges are important. An ally on environmental issues in the energy industry is invaluable. However, we would like to ensure that BP is "walking the talk."

Acting with our clients, Walden is able to push to elicit better social performance from client companies. Walden is now re-focusing its dialogue with BP, pushing it to measurably improve and report on key metrics for its U.S. refinery and infrastructure performance. We believe that BP can go beyond 'Beyond Petroleum' and beyond its current difficulties. ◆

—M. Benton with T. Smith

Team Industrial Services

cutting edge companies

This column highlights companies in the business of providing solutions to social and environmental challenges. Featured companies are typically held in the SmallCap Innovations portfolios offered to Walden clients.

Imagine you are running an oil refinery and your facility is operating at maximum capacity. One of your trusted engineers alerts you that a primary pipe is in danger of failing. You, as a responsible manager, want to fix this pipe in a safe, cost-effective manner, but you are concerned about the consequences of shutting down production completely. What do you do?

You could call **Team Industrial Services, Inc.**, a leading provider of specialty maintenance and construction services related to pressurized piping systems and processes of the petrochemical, refining, and power industries. To start, Team would evaluate the distressed pipe by employing its nondestructive testing and examination methodologies. These include radiography, ultrasound, and the use of magnetic particles to evaluate the present condition of piping and to predict remaining operability.

Heidi Harris is a Research Associate

Team is a world leader in high-temperature, high-pressure applications known as hot tapping. During hot tapping, a drilling machine cuts a hole in an on-stream, pressured pipeline. A new line is then connected to the old line without any leakage. The entire process can be completed without interrupting operations. On-stream repairs can prevent a continued loss through leaks, avoid costly energy and production losses that accompany equipment shutdowns, and lessen emissions escaping into the atmosphere. Team can hot tap piping systems containing steam, water, hydrocarbons, acids, gases, and other fluids.

Team also offers more routine repair services, such as technical bolting and leak detection. Technical bolting services provide for the disassembly and assembly of bolted joints. These methods focus on overall joint integrity and are a critical part of regular maintenance. Leak detection products identify and monitor emissions from specific equipment, allowing the customer to be compliant with environmental regulations. Team records data and prepares reports in accordance with Environmental Protection Agency requirements.

Team stands to benefit from an increased focus on safety in the wake of accidents that have recently made headlines, such as the explosion at BP's Texas City refinery in March 2005. Team's innovative products and services demonstrate that a high level of productivity within a responsible and compliant operating framework is possible. ◆

—H. Harris

PENSION PROTECTION ACT OF 2006

The Pension Protection Act of 2006 (PPA) was signed into law by President Bush on August 17, 2006.

While the Act made many changes to pension laws, it also included numerous provisions affecting retirement savings as well as charitable and estate planning. We believe several aspects of the Act to be of particular interest.

Provisional Laws Made Permanent

One of the major benefits of the Act is that it has made permanent many savings provisions under the Economic Growth and Tax Relief Reconciliation Act of 2001 that were originally set to expire in 2011. The most relevant of these are:

- Inflation indexing of IRA contributions: $4,000 in 2006 and 2007, $5,000 in 2008 and continued inflation adjustments each year thereafter.
- Catch-up contributions to IRAs for individuals age 50 or older: $1,000 above the annual limit made permanent, but the Act does not index the $1,000 catch-up portion for inflation.
- 529 Plan withdrawals: PPA makes qualified tax-free withdrawals permanent.

Other Important Provisions

Effective for 2006 and 2007 only: Charitable donations paid from an IRA directly to a charitable organization are tax free distributions for individuals $70^1/_2$ or older. This means, since the donation is federal income tax free, one does not receive a charitable deduction on the income tax return. Donor advised funds and private foundations are specifically excluded from this provision.

Effective 2007: Non-spousal beneficiaries can roll over their interests in a qualified retirement plan, government plan, or tax sheltered annuity to an IRA. Previously, only spouses were allowed this option. The IRA will be maintained as an "inherited" IRA. ◆

As always, we strongly recommend consulting with your tax or estate professional prior to making any decisions regarding your estate or planning goals.

—S. Benevento, CFP®

ETHANOL: MOTOR FUEL OF THE FUTURE?

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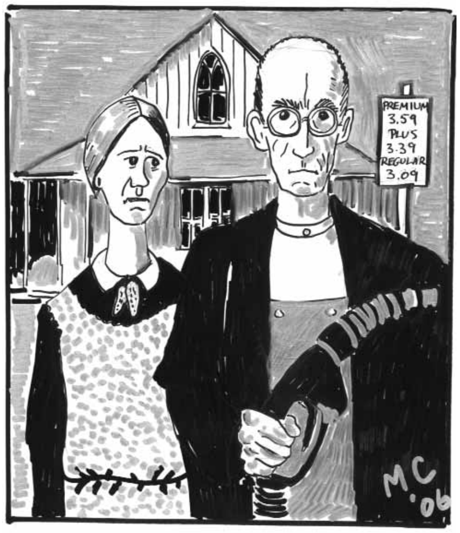
derived from ethanol. However, in separate reviews of relevant literature, the U.S. Department of Agriculture and environmental group Natural Resources Defense Council (NRDC) concluded that ethanol has a positive energy value. Previous studies indicating negative energy values appear to be based, at least in part, on data from older, smaller scale ethanol facilities, using corn grown with less productive farming techniques and lower yielding seeds, and using fertilizer that was produced less efficiently. Unfortunately, some of these more productive seeds and farming techniques are not necessarily desirable from an environmental perspective.



Alternatives to Corn?

While corn ethanol costs are currently cheaper than other potential clean fuels such as biodiesel or fuel cells, additional economical and environmentally friendly alternatives exist. Costs for sugar cane-based ethanol production in Brazil, where ethanol accounts for one third of the fuel use, are less than half of those for corn in the U.S. This is primarily due to the higher yield-per-acre and starch-per-plant of Brazilian sugar cane (as well as lower land and labor costs). However, in order to protect the U.S. corn industry, there is a $0.54 per gallon tariff for most ethanol imported to the U.S.

Switchgrass or other crops may be a promising source of cellulosic ethanol, which uses the entire plant to make ethanol. Research in this regard has support from the Bush Administration and environmentalists. As noted by NRDC, switchgrass is a “native, perennial prairie grass that has low nitrogen runoff, very low erosion, and increased soil carbon, and also provides good wildlife habitat.”

This contrasts with corn, which requires significant irrigation water, use of fertilizer, and land use. Corn for ethanol currently accounts for approximately 15% of the U.S. corn harvest, and an estimated 75% of U.S. cropland would be needed for 50% of U.S. gasoline needs. A key benefit of cellulosic ethanol is the reduced use of cropland and fossil fuels. Canadian biotech company Iogen, backed by Goldman Sachs and energy firm Royal Dutch Shell, operates a demonstration plant that is refining ethanol from cellulosic ethanol.

Where Do I Fill Up?

There are only a few million flexible fuel vehicles (FFVs) in the U.S. that can run on E85 or gasoline, even though such vehicles cost only a few dollars more to mass produce than standard vehicles. By comparison, most vehicle sales in Brazil are now FFVs. And, there are less than 1,000 E85 pumps at the 170,000 U.S. retail gasoline outlets. Nonetheless, the Big 3 automakers have ramped up production of FFVs, and the Bush Administration is boosting credits and grants for retail gasoline stations that convert to E85 pumps.

While not a panacea, and albeit with significant subsidies thus far, ethanol has played a significant role in mitigating the U.S. “addiction” to large cars and trucks. More innovation, more efficient feedstocks and better public policies will help improve its economics and environmental benefits. As such, ethanol may play a small but important role in a diversified mix of cleaner energy sources. ◆

—K. Scott

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