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JANUARY 13, 2011

Valero to Invest in Ethanol Plant

By **RUSSELL GOLD**

Oil refiner **Valero Energy Corp.** plans to invest in one of the first commercial-scale plants to convert wood into ethanol, an unusual vote of confidence by a major oil company in the emerging technology used to produce so-called cellulosic biofuels.

The investment may also be a sign that nascent cellulosic-ethanol technology is turning a corner after years of struggling to commercialize new technology, secure financing and drive down operating costs.

Seedlings for Cellulosic Biofuels

Valero has made a series of investments in ethanol production

January 2009 Valero Invests in Colorado-based cellulosic ethanol startup ZeaChem.

April 2009 Buys several corn ethanol plants for \$556 million.

December 2009 Agrees to buy three additional corn ethanol plants for \$281 million.

May 2010 Forms a technology joint venture with algae-fuels maker Algenio Biofuels.

December 2010 Completes the sale of its Paulsboro, N.J., oil refinery for \$707 million.

January 2011 Discloses a deal with cellulosic-ethanol developer Mascoma. Under the agreement, Valero will invest \$50 million in a proposed Kinross, Mich., plant that will convert wood to ethanol; it also will purchase the plant's production, and take a 50% stake in the plant.

There are already substantial, mature industries that turn corn into ethanol in the U.S. and sugarcane into ethanol in Brazil. But the U.S. has set aside funding to encourage the development of fuel from wood and other plants that aren't used for food.

"You can make cellulosic ethanol today, the point is can you make it profitably?" asked George Stutzmann, Valero's vice president of alternative energy.

In this case, he said, the answer is yes, in part because of federal subsidies for cellulosic ethanol. Valero and its partner in the project, Mascoma Corp., are seeking federal loan guarantees for the new plant, which is to be built in Kinross, Mich., near the Canadian border.

Mascoma, a closely held company based in Lebanon, N.H., has been running a pilot plant in upstate New York for two years.

Problems may yet arise as the technology makes the leap to commercial-size operations. Even then, the projected output—40

million gallons a year—is a tiny fraction of the 138 billion gallons of gasoline consumed annually in the U.S.

But Valero is optimistic. "It is not going to happen tomorrow, but within 10 years, you could have a cellulosic industry," Mr. Stutzmann said.

Valero has agreed to purchase and distribute the ethanol produced at the Michigan plant, which could be operational by 2013. The refiner agreed to invest up to \$50 million and expects a 50% stake in the project.

Mascoma and other investors will pay for the rest of the \$350 million plant, assuming they get a critical loan guarantee from the Department of Energy for about \$210 million of construction costs.

Paul Dickerson, who headed the Energy Department's Office of Energy Efficiency and Renewable Energy under President George W. Bush and is now a corporate lawyer, says the deal may be "the first key indicator" that the fuel could be produced at a price competitive with ethanol made from corn.

"The time has come," said Bill Brady, chief executive of Mascoma, to "show the world it can be done."

In 2006, Mr. Bush set out a goal to make cellulosic ethanol "practical and competitive within six years," as he said in his State of the Union address that year. But the industry has fallen well short of ambitious Congressional production targets.

In 2011, the government expects about 3.9 million gallons to be produced, far less than the 250 million gallon target.

Write to Russell Gold at russell.gold@wsj.com

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JANUARY 13, 2011, 4:16 PM

A Step Toward Car Fuel From Wood Waste

By *MATTHEW L. WALD*

Mascoma The Mascoma Corporation, which demonstrates cellulosic ethanol production at this site in Rome, N.Y., plans to break ground on a commercial biorefinery in Michigan.

Almost everybody likes the idea of [cellulosic ethanol](#), or ethanol made from the non-food portion of crops and from waste like wood scraps or paper. But so far nobody is producing bulk amounts.

A federal law requires companies that produce gasoline to blend in [250 million gallons of cellulosic ethanol](#) this year, but the Environmental Protection Agency reduced that quota to a more realistic six million gallons.

On Thursday, however, one of the many companies working toward commercial production, the [Mascoma Corporation](#) of Lebanon, N.H., said it had reached an agreement with [Valero](#), the nation's largest independent oil refiner, under which Valero would take the entire output of a commercial plant that Mascoma is to break ground on this year in Kinross, Mich. It is the first such "offtake" agreement in the industry, Mascoma said. The plant is supposed to be running by 2013.

Valero will invest up to \$50 million in the Kinross plant, said William J. Brady, Mascoma's chief executive. The entire plant would cost \$350 million, and not all of that is in hand yet, Mr. Brady said, but "getting the Valero investment has made the rest a lot easier."

Other investors in Mascoma include [General Motors](#). Mascoma is seeking loan guarantees from the Energy Department.

The company, which plans to use wood waste, could turn out to have the first commercial-scale plant. Mr. Brady said that three other companies could also produce ethanol from cellulose in the near future: [BlueFire Ethanol](#), which uses grasses; [POET](#), which is turning to cobs and other non-food portions of the corn plant; and [Abengoa](#), which is turning to parts of the corn plant beyond the kernel.

[Range Fuels](#) has built a commercial-scale plant near Soperton, Ga., and produced some ethanol there from wood waste, but not in commercial quantities.

Valero said the amount it would pay for ethanol from the new plant would be based on the market price of the fuel, within some upper and lower limits. "We don't have the final details of that nailed down," Mr. Brady said.

And of course, delays are possible. In 2006, when Mascoma announced it had raised \$30 million from prominent investors like Khosla Ventures and Kleiner Perkins Caufield & Byers

for a commercial plant, it said it would be running by 2008.

UPDATE 1-Valero invests \$50 mln in cellulosic ethanol plant

Thu Jan 13, 2011 8:22pm GMT

- * Valero to purchase facility's 40 mln gallons of ethanol
- * Michigan plant will begin production in 2013
- * Additional funding from Michigan state, Dept of Energy (Adds details of investment, background)

LOS ANGELES, Jan 13 (Reuters) - U.S. oil refiner Valero Energy Corp (VLO.N) will invest up to \$50 million in a plant that will produce ethanol from wood, a major mainstream backing for the emerging technology.

The investment in venture capital-backed Mascoma Corp includes a deal for Valero to purchase the facility's 40 million gallons of cellulosic ethanol, the companies said on Thursday in a joint statement.

The \$350 million plant will be located in Kinross Charter Township, Michigan. The state of Michigan has contributed \$23.5 million to fund the project, and Mascoma is also waiting for final approval of a \$210 million loan guarantee from the U.S. Department of Energy.

The company will begin construction on the plant this year and expects it to produce ethanol in 2013.

Cellulosic ethanol, which is made from non-food crops like switchgrass and agricultural waste, is widely thought to be better for the environment than corn-based ethanol. However, producing cellulosic ethanol is more expensive than making the fuel from grains because there are more steps required to convert the materials into starch for fermenting.

Difficulties ramping up commercial-scale cellulosic ethanol facilities prompted the Environmental Protection Agency late last year to slash the amount of cellulosic that must be produced this year. It said last November that five plants would likely produce 6.6 million gallons of cellulosic in 2011, far less than the original target of 250 million gallons.

Valero, the top U.S. independent refiner, entered the market for corn ethanol in 2009 when it bought several assets of bankrupt VeraSun Energy Corp.

Investors in Lebanon, New Hampshire-based Mascoma include Khosla Ventures, Kleiner Perkins Caufield & Byers, VantagePoint Venture Partners, Flagship Ventures, Atlas Venture, General Motors Co (GM.N) and Marathon Oil Corp (MRO.N).

(Reporting by Nichola Groom; Editing by Richard Chang)

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Oil to the Rescue: Valero Backs Mascoma

content by  earth2tech

By Katie Fehrenbacher at [Earth2Tech](#)
Thu Jan 13, 2011 12:00pm EST

For next-generation biofuels to make any type of dent in the fossil fuel industry, oil companies will have to get on board, and here comes one to the rescue for the struggling cellulosic ethanol sector. Cellulosic ethanol startup [Mascoma](#) announced Thursday morning that oil giant Valero will invest \$50 million into the construction of Mascoma's delayed commercial-scale cellulosic ethanol plant in Kinross, Mich, and Valero will also potentially enter into an off-take agreement for the plant's ethanol. In addition, Valero has made an equity investment into Mascoma.

Six-year-old Mascoma has long been one of the more promising cellulosic ethanol startups. Lux Research went so far as to give Mascoma "top chef status" in a biofuel ranking report last year, citing Mascoma's "strong financial support from investors," and "potentially cost-cutting" process for breaking down cellulose and fermenting the sugar with a single microbe.

That strong investor support includes close to \$100 million (before Valero) from a long list of investors including Khosla Ventures, Flagship Ventures, Kleiner Perkins, VantagePoint, General Catalyst Partners, Atlas Venture, Pinnacle Ventures and car company General Motors. In addition to private funds, Mascoma has received numerous grants from the DOE totaling more than \$30 million and also state grants from New York and Michigan of over \$30 million.

Still, with all that support, Mascoma's commercial-scale ethanol plant in Kinross was originally planned to begin construction sometime in 2009, with cellulosic ethanol production starting perhaps by 2011. Now, according to the release this morning, the facility will break ground in 2011. Pretty much every cellulosic ethanol company has had to delay commercial-scale production due to a variety of factors like the economy, and an inability to get the manufacturing costs low enough.

The Environmental Protection Agency didn't include Mascoma in its short list of cellulosic ethanol producers that would produce fuel in 2011 — that list included Range Fuels, DuPont Danisco, Fibrighat, KL Energy, and KiOR. Though the EPA says that many more companies, including 20 plants, could produce potentially 300 million gallons of cellulosic ethanol in 2012.

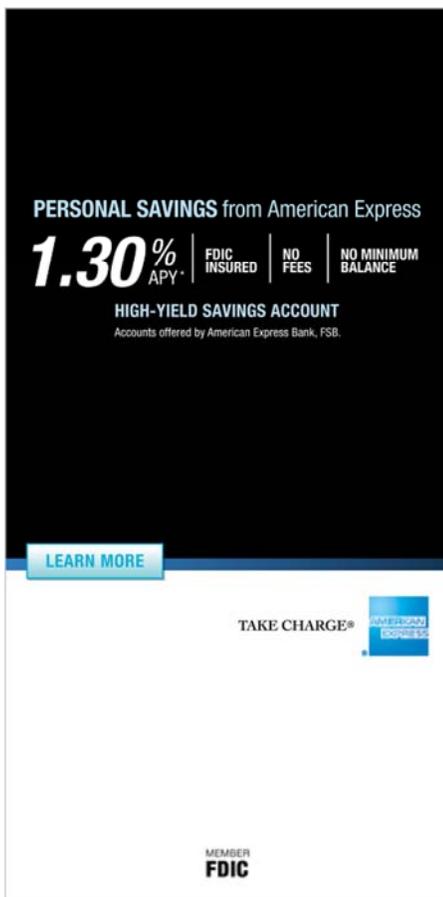
Valero has turned out to be one of the more aggressive oil firms in biofuels. The oil refiner took stakes in algae fuel maker Solix Biofuels, and cellulosic ethanol maker ZeaChem, and also bought up the the corn ethanol plants of bankrupt ethanol producer VeraSun. Other oil companies that have shown an interest in biofuels include Exxon (and its Synthetic Genomics deal) and BP, which bought up Verenum's biofuel business.

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Billionaire-backed Biofuels Firm Mascoma Inks Deal With Refiner Valero

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Biofuels company Mascoma has announced it cut a deal with oil refiner Valero to back construction of a commercial scale cellulosic ethanol

biorefinery in Michigan. As part of the deal, Valero has promised to invest up to \$50 million in Mascoma and buy the fuel that the plant produces.

Mascoma is backed by a number of high-profile investors including billionaire venture capitalist [Vinod Khosla](#) via Khosla Ventures; billionaire VC [John Doerr](#) via Kleiner Perkins Caufield & Byers; [General Motors](#) and [Marathon Oil](#). The company is currently operating a pilot scale cellulosic ethanol plant that produces 200,000 gallons a year.

Mascoma says it will be building one of the world's first commercial scale wood-based cellulosic ethanol biorefineries. It's slated to break ground in 2011 in Kinross Charter Township, Michigan and will have a planned annual production of 40 million gallons of cellulosic ethanol. Valero has entered into an off-take agreement to purchase 40 million gallons of cellulosic ethanol from Mascoma.

Mascoma is getting financial help to build the biorefinery from the US Department of Energy and the Michigan Economic Development Corp. "Valero's proposed investment in our first commercial-scale production facility proves the economic practicality of Mascoma's technology for the conversion of woody biomass into ethanol," Bill Brady, Chief Executive Officer of Mascoma, said in a press release announcing the deal.

Since 2008 a raft of biofuels companies and even large chemical companies like DuPont have been boasting about superior technologies that will enable turning waste matter like corn cobs, wood chips and municipal waste into biofuels. (See "[Big Guns Tackle Next Gen](#)")

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Wood-to-ethanol plant gets taker in oil refiner

by [Martin LaMonica](#)

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Biofuel company Mascoma said today it has the financing and the customer needed to build a biorefinery in Michigan to make ethanol from wood.

The company said that oil refiner Valero Energy will invest up to \$50 million in equity needed for the project, which is expected to start construction later this year.

The entire project is expected to cost \$350 million which will be funded by a Department of Energy loan, the state of Michigan, Valero, and other investors, a company representative said. With the Energy Department loan guarantee, Mascoma's subsidiary in Michigan, Frontier Renewable Resources, expects to raise debt for the project as well.

The Kinross, Mich., plant anticipates using locally harvested pulpwood, the wood used for making pulp for paper, and convert it into ethanol at a rate of 40 million gallons per year.

Valero has also agreed to use the ethanol in its refining. Up to 10 percent of the fuel from gas pumps includes ethanol, now made from corn.

If the plant goes ahead as planned, it will be a significant step forward for the cellulosic ethanol industry which has fallen short of expectations. Ethanol made from agriculture and forestry residue is considered more environmentally sound than using corn as a feedstock.

The 2007 energy law called for 5 million gallons of cellulosic ethanol last year but less than 1 million gallons were produced, according to a recent [analysis from ClimateWire](#).

Cellulosic ethanol companies had promised to have commercial-scale plants operating by now, but were beset by technical and financial problems. Mascoma, which has been running a pilot plant in Rome, N.Y., has been working on securing the funds to finance the Michigan biorefinery for over a year.

Mascoma has a technology that uses [genetically engineered microorganisms](#) to break down the cellulose in plants and produce ethanol, a streamlined process designed to lower the cost of production.

The Michigan plant proposal has come under fire by some groups, including the Sierra Club, which have legally challenged the air permit provided to the plant, according to [an AP report](#).



Click on the photo to see inside Mascoma's Lebanon, N.H., laboratory which is developing the cellulosic ethanol process.

(Credit: Martin LaMonica/CNET)



Martin LaMonica

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Martin LaMonica is a senior writer for CNET's Green Tech blog. He started at CNET News in 2002, covering IT and Web development. Before that, he was executive editor at IT publication

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[Valero invests in Mascoma, signs cellulosic ethanol offtake agreement; inks LOI for up to \\$50M in equity](#)

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Mascoma execs at the feedstock delivery area of the company's demonstratio plant in Rome, NY. From left: Plant Director Eric Oleson; Senior VP Alan Belcher; Sr. Director, Process Engineering Steve Licht; Biofuels Digest's Flavia Marples

In New Hampshire, Mascoma announced that Valero Energy has joined as an investor in the company.

Further, Mascoma, Valero, and Mascoma's operating subsidiary, Frontier Renewable Resources, (jointly owned with J.M. Longyear) have signed a non-binding letter of intent to support the construction of Mascoma's 40 million gallon cellulosic ethanol plant in Kinross, Michigan. Groundbreaking on the project is slated for later this year.

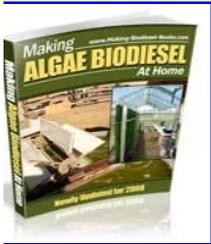
Under the terms of the letter of intent, Valero would potentially invest up to \$50

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million of the equity required to finance the project through Frontier Kinross LLC, a subsidiary of Frontier, and would enter into an off-take agreement for the project's ethanol production. As further support of the project, Valero will provide project development and construction oversight services.

Frontier will use hardwood pulpwood, which is selectively harvested, naturally regenerated, and is an underutilized, abundant resource in the area surrounding the Kinross biorefinery. Mascoma's 200,000 gallons of cellulosic ethanol per year demonstration facility in Rome, New York, has demonstrated the viability of the technology over the past two years and sets the stage for the commercial facility.

"Valero's proposed investment in our first commercial-scale production facility proves the economic practicality of Mascoma's technology for the conversion of woody biomass into ethanol," said Bill Brady, Chief Executive Officer of Mascoma. "We are also thrilled to have Valero as a shareholder in Mascoma Corporation as there are many synergies even beyond the Kinross facility, where the technologies we have developed could be helpful to Valero's business."

"Adding Valero as a partner is the perfect addition to complete this project," said Steve Hicks, Chief Executive Officer of Frontier Renewable Resources and President & CEO of J.M. Longyear, LLC. "The culmination of Mascoma's leading Consolidated Bioprocessing technology, coupled with Longyear's expertise in supplying the raw materials, is the perfect compliment for a leading oil company to come in as an equity and off-take partner."

Mascoma recently announced the acquisition of SunOpta BioProcess Inc. (SBI), a world-leading fiber preparation and pretreatment company, creating a company with comprehensive capabilities for converting non-food cellulose (wood chips, energy crops and organic solid waste) into ethanol and high value co-products. With the addition of SBI and Valero, Mascoma has now covered the entire process of commercializing cellulosic ethanol, from raw materials supply, to pre-processing, through Mascoma's CBP process and into final distribution.

2011 – Strategic investors rule

In our "Top 10 Biofuels Predictions for 2011," we wrote: "#1. Strategic investors rule. Although project finance will make a small recovery, and the bond market will provide some liquidity for expansion of advanced biofuels capacity, fresh equity at the scale needed for commercial expansion is going to come increasingly from committed Strategic investors. We expect waste, pulp and paper, oil majors and national oil companies, and chemical companies, to be the biggest investors. Big Biotech and major oil & grains aggregators will be the other players increasingly active on the scene. At the same time, expect companies like Shell to sharpen their portfolio by focusing on their best expansion opportunities, and dropping technologies that do not meet near-term commercial or long-term value targets.

Further reading on Mascoma

Read our "[Mascoma: Inside the SunOpta acquisition.](#)"

Or, "[Mascoma's magic world for magic bugs.](#)"

Or "[Stellenbosch Biomass Technologies forms to commercialize Mascoma technology in South Africa.](#)"

Or, [more from Mascoma at mascoma.com.](#)

Further reading on Valero

"[Valero invests in Algenol.](#)"

"[Valero expanding E85 distribution in Texas.](#)"

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ENERGY, CELLULOSIC ETHANOL, DEALS

Valero Energy Takes Key Role in Mascoma's Michigan Ethanol Project

Ryan McBride 1/13/11

Lebanon, NH-based **Mascoma** has found a key piece of funding for a commercial-scale ethanol plant in northern Michigan. The oil firm Valero Energy has inked a non-binding agreement to invest up to \$50 million to fund construction of a refinery that would use wood-based materials to make ethanol.

Frontier Renewable Resources, a joint venture of Mascoma and its Michigan-based partner J.M. Longyear, expects to break ground on the plant this year and to begin production of ethanol there in 2013, according to Mascoma. The plant is expected to be able to initially churn out 40 million gallons of ethanol per year, and it will be somewhat unique because it will rely on pulpwood as its main feedstock rather than food crops such as corn or soybeans.

This is a big deal for Mascoma, which has been working for years to bring its process for making cellulosic ethanol up to commercial scale. The company has showed its potential for commercial-scale production at its pilot facility in Rome, NY. Yet a lack of financing had delayed the project in Kinross Charter Township, MI, and last year **Mascoma CEO Bill Brady** told **Xconomy** that production would likely begin there in 2013 rather than the previous expected date in 2012.

Valero has agreed to provide a crucial equity piece to fund for the project, in addition to making a separate and unspecified investment in Mascoma, according to Mascoma. The firm says that the project has additional funding from the Michigan Economic Development Corporation and the U.S. Department of Energy. Valero, which says it owns 10 ethanol plants, has also agreed to take ethanol from the Kinross facility and sell it to its customers. Ethanol is a gasoline additive.

"Valero's proposed investment in our first commercial-scale production facility proves the economic practicality of Mascoma's technology for the conversion of woody biomass into ethanol," said Mascoma's Brady, in a statement. "We are also thrilled to have Valero as a shareholder in Mascoma Corporation as there are many synergies even beyond the Kinross facility, where the technologies we have developed could be helpful to Valero's business."

Ryan McBride is Xconomy's correspondent. You can reach him at rmcbride@xconomy.com, or follow him on Twitter at http://twitter.com/Ryan_McBride.

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Valero planning equity investment in Michigan biorefinery

San Antonio Business Journal

Date: Thursday, January 13, 2011, 11:17am CST

Valero Energy Corp., the nation's largest independent oil refiner, reached a deal with **Mascoma Corp.** and its Frontier Renewable Resources LLC subsidiary to help finance the construction of one of the world's first commercial scale cellulosic ethanol biorefineries.

Under the terms of the agreement, Valero plans to invest up to \$50 million in the facility, to be located in Kincross Charter Township, Mich. The biorefinery should have an annual production of 40 million gallons of low-carbon cellulosic ethanol. The refinery will turn hardwood pulp into ethanol.

San Antonio-based Valero (NYSE: VLO) owns 15 petroleum refineries, 10 ethanol plants, a wind farm and a network of 5,800 retail and wholesale gas stations.

For more information, visit this [link](#).

www.mascoma.com

Oil to the Rescue: Valero Backs Mascoma

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By Katie Fehrenbacher at [Earth2Tech](#)
Thu Jan 13, 2011 12:00pm EST

For next-generation biofuels to make any type of dent in the fossil fuel industry, oil companies will have to get on board, and here comes one to the rescue for the struggling cellulosic ethanol sector. Cellulosic ethanol startup [Mascoma](#) announced Thursday morning that oil giant Valero will invest \$50 million into the construction of Mascoma's delayed commercial-scale cellulosic ethanol plant in Kinross, Mich, and Valero will also potentially enter into an off-take agreement for the plant's ethanol. In addition, Valero has made an equity investment into Mascoma.

Six-year-old Mascoma has long been one of the more promising cellulosic ethanol startups. Lux Research went so far as to give Mascoma "top chef status" in a biofuel ranking report last year, citing Mascoma's "strong financial support from investors," and "potentially cost-cutting" process for breaking down cellulose and fermenting the sugar with a single microbe.

That strong investor support includes close to \$100 million (before Valero) from a long list of investors including Khosla Ventures, Flagship Ventures, Kleiner Perkins, VantagePoint, General Catalyst Partners, Atlas Venture, Pinnacle Ventures and car company General Motors. In addition to private funds, Mascoma has received numerous grants from the DOE totaling more than \$30 million and also state grants from New York and Michigan of over \$30 million.

Still, with all that support, Mascoma's commercial-scale ethanol plant in Kinross was originally planned to begin construction sometime in 2009, with cellulosic ethanol production starting perhaps by 2011. Now, according to the release this morning, the facility will break ground in 2011. Pretty much every cellulosic ethanol company has had to delay commercial-scale production due to a variety of factors like the economy, and an inability to get the manufacturing costs low enough.

The Environmental Protection Agency didn't include Mascoma in its short list of cellulosic ethanol producers that would produce fuel in 2011 — that list included Range Fuels, DuPont Danisco, Fiberight, KL Energy, and KiOR. Though the EPA says that many more companies, including 20 plants, could produce potentially 300 million gallons of cellulosic ethanol in 2012.

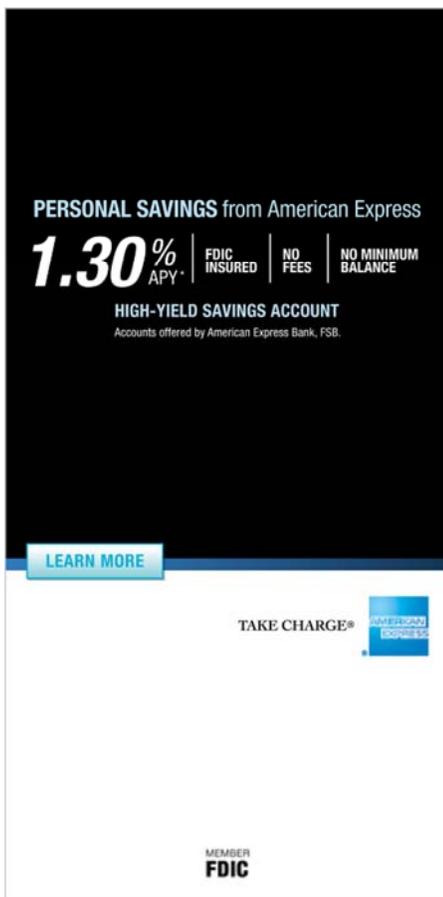
Valero has turned out to be one of the more aggressive oil firms in biofuels. The oil refiner took stakes in algae fuel maker Solix Biofuels, and cellulosic ethanol maker ZeaChem, and also bought up the the corn ethanol plants of bankrupt ethanol producer VeraSun. Other oil companies that have shown an interest in biofuels include Exxon (and its Synthetic Genomics deal) and BP, which bought up Verenium's biofuel business.

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