

## **“B&W, The Ohio State University Awarded U.S. DOE Funding for Continued Development of Carbon Dioxide Capture Technology”**

*MRO Magazine (press release), May 1, 2014*

CHARLOTTE, N.C.

The Babcock & Wilcox Company (B&W) (NYSE:BWC) is pleased to announce that the U.S. Department of Energy has selected its subsidiary, Babcock & Wilcox Power Generation Group, Inc. (B&W PGG), to receive a \$2.5 million award for Phase 2 development of iron-based Coal Direct Chemical Looping (CDCL) technology.

Researchers with B&W PGG and The Ohio State University (OSU) have collaborated on the development of CDCL technology - an advanced process for clean power generation and carbon dioxide (CO<sub>2</sub>) capture at potentially lower cost than other CO<sub>2</sub>-capture technologies.

“Innovative solutions to capture and sequester CO<sub>2</sub> are essential to coal’s future as a clean energy option in the United States,” said B&W PGG President and Chief Operating Officer J. Randall Data. “We appreciate the DOE’s continued support of our research and development efforts and look forward to adding CDCL technology to B&W PGG’s suite of advanced power generation systems and CO<sub>2</sub> capture options.”

CDCL technology was developed and successfully tested at bench scale at OSU’s labs in Columbus, Ohio. B&W PGG is leading the commercial design effort for this novel technology, and research and testing are ongoing at the B&W Research Center in Barberton, Ohio and at OSU’s labs.

Read more: <http://www.mromagazine.com/press-releases/story.aspx?id=1003040793&er=NA>

## **“How 'Big Corn' lost the ethanol battle to Philadelphia refiners”**

By Cezary Podkul and Jeff Mason of Reuters, *MSN News*, May 12, 2014

NEW YORK/WASHINGTON (Reuters) - Six months ago the U.S. oil industry scored a surprise win against farm groups when the Obama administration proposed slashing the amount of ethanol refiners must blend into gasoline, a move that could save them billions of dollars.

Stunned by the reversal, producers of the corn-based biofuel and their supporters are now fighting back ahead of a June deadline for the Environmental Protection Agency (EPA) to make a final decision on the cut.

The clash has been portrayed as a battle between "Big Oil" and "Big Corn," two powerful and deep-pocketed lobbies. But a Reuters review of public records and interviews with lawmakers, lobbyists and executives reveals a more complex picture.

A private equity firm and an airline helped convince the Obama administration to backtrack, at least temporarily, on a policy it has supported for years: requiring steadily-rising volumes of ethanol to be blended into gasoline each year, a key to shifting U.S. energy consumption toward renewable sources.

The ethanol industry, blindsided by the proposed cut, has said it was orchestrated by "Big Oil." However, some of the most effective players in the fight weren't traditional oil majors but rather The Carlyle Group and Delta Air Lines, owners of two Philadelphia-area refiners.

Together with their allies, the refiners helped convince policymakers that the rising mandates would cripple their businesses and threaten thousands of jobs.

For key White House officials including Gene Sperling, President Barack Obama's top economic adviser at the time, the pitch was familiar: a year earlier, many of the same players had worked with him to rescue Philadelphia refineries from closure, saving jobs and keeping a lid on East Coast gas prices.

In one exchange last July, Philadelphia Congressman Robert Brady contacted Vice President Joe Biden on behalf of Carlyle, which bought two struggling refineries in his district in 2012. They had been on the brink of closure due to lower margins then; now they were threatened by biofuel mandates, whose cost eclipses the salaries of all refinery workers combined.

Read more: <http://news.msn.com/us/how-big-corn-lost-the-ethanol-battle-to-philadelphia-refiners>

## **“Arrays of nano-liter photobioreactors to accelerate algal biofuel development”**

*Texas A&M University, May 14, 2014*

A team led by Arum Han, associate professor in the Department of Electrical and Computer Engineering at Texas A&M University, recently had its paper on microfluidic systems for algal biofuel development published in the journal *Lab on a Chip* as a cover article.

Microalgae, photosynthetic microorganisms present in most water, have been envisioned as future sources of renewable biofuel. Compared to current oil-producing feedstocks such as corn and soybean, microalgae are especially more attractive thanks to their significantly higher oil content. Microalgae also can be grown in wide ranges of water, and thus do not have to compete

against food production requiring arable land. However, significant improvements are still required to make algal biofuel commercially viable, such as developing better microalgal strains showing higher growth and higher oil production.

Han's team is developing microfluidic lab-on-a-chip systems that can be used as high-throughput screening tools to quickly evaluate the growth and oil production characteristics of numerous algal strains under various growth conditions. Their paper describes how the team demonstrated the development of 10s or 100s of pico-liter sized photobioreactors on a business card sized chip. The developed microsystem utilizes microfluidic technologies to individually control light conditions (intensity and day-night cycle) for each of the 10s or 100s of photobioreactors, and was used to understand how microalgae grow and produce oil under different environment. The article also was featured as a Lab on a Chip HOT article.

Read more: <https://engineering.tamu.edu/news/2014/05/14/arrays-of-nano-liter-photobioreactors-to-accelerate-algal-biofuel-development>

### **“Smaller-scale advances driving shale gas innovations”**

By Collin Eaton, *Fuel Fix*, May 15, 2014

HOUSTON – Investors' growing reluctance to back big, complex projects is driving the energy industry to break up infrastructure plans into smaller pieces, potentially putting new projects and technology development into the hands of many more players, energy executives said Thursday.

Opening the door to new entrants is speeding up how quickly new and incremental technological advances are spreading through the market, a sign that the entrepreneurship of smaller market-cap companies is working out for U.S. shale development and other frontiers in oil and gas, a panel of energy experts said during the ninth annual Mayer Brown Global Energy Conference in Houston.

The “age of natural gas” has distinguished itself from eras dominated by coal and oil in that it is much more difficult to transport.

That problem is convincing industry players and their financiers that they need to develop smaller manufacturing plants, smaller gas-to-liquids facilities and smaller generation plants closer to sources of abundant gas across the U.S., said Roy Lipski, CEO of Velocys, a U.K.-based company that deploys smaller-scale gas-to-liquids units to turn remote unconventional resources into fuels.

“It's a necessity that we go with smaller production,” Lipski said. “It's easier and more practical to implement, it puts less strain on supply chains, and smaller projects are less subject to delays. They appeal much more to the sources of capital who are turning to large independent oil companies and saying we don't want you to deploy such large amounts of capital in single points of risk.”

The changing tide, he said, is why the industry “by necessity is going to put these projects, these technologies, these capabilities in the hands of a much, much larger group of players.”

As for the larger projects, Lipski used the example of massively expensive Australian liquefied natural gas export facilities that faced long delays after companies encountered several unanticipated construction challenges.

Read more: <http://fuelfix.com/blog/2014/05/15/smaller-scale-advances-driving-shale-gas-innovations/?shared=email&msg=fail>

### **“Shell Refinery to Cut GHGs 15%”**

*Environmental Leader*, May 21, 2014

Shell is considering retiring one of two coking units at its California refinery, a move that would cut the plant’s greenhouse gas emissions 15 percent, Bloomberg News reports.

This would shrink the Martinez, Calif.’s refinery’s reliance on heavy oils and is part of an effort to run lighter crude, the news agency says.

Shell has applied for a permit to shut the flexicoker at the 156,400-barrel-a-day plant as fracking and horizontal drilling produce record volumes of light oil in other parts of the US benefiting from the shale boom.

Last September Shell selected Ascension Parish, near Sorrento, La., as the site for its planned \$12.5 billion gas-to-liquids (GTL) facility. The company’s Gulf Coast GTL facility would be one of the first of its kind built to commercial scale in the US, the company says. If built, the proposed project would use natural gas to create cleaner-burning transportation fuels, such as natural gas-based diesel and jet fuels and other products, such as specialty waxes and the building blocks for lubricants, plastics and detergents.

Read more: <http://www.environmentalleader.com/2014/05/21/shell-cuts-ghgs-15-shifts-to-lighter-crude/>

### **“U.S. may adjust 2014 corn ethanol target after outcry: sources”**

By Ayesha Rascoe, *Reuters*, May 23, 2014

(Reuters) - The Obama administration is likely to partly backtrack on proposed steep cuts to renewable fuel targets for 2014 when it finalizes a rule due out in June, industry sources said.

Biofuel groups expect the Environmental Protection Agency to send the final proposed targets to the White House as soon as Friday.

The EPA shocked biofuel supporters in November with a draft rule that slashed federal requirements for biofuel use in gasoline and diesel. The agency argued that U.S. energy markets could not absorb the levels of renewable fuels that would be required by a 2007 law.

Since then, though, rising projections for gasoline consumption give the agency leeway to raise its corn ethanol target from November's proposal of about 13 billion gallons to about 13.6 billion, a biofuel industry source said.

The more gasoline consumed, the more ethanol that can be absorbed before hitting the "blend wall," the point at which the law would require more ethanol to be used than the 10 percent blend found at most U.S. gas stations.

The rumored adjustment would still leave the corn ethanol target for 2014 far below the 14.4 billion gallons called for by law, and will likely enrage oil companies who lobbied hard for cuts to the targets.

Read more: <http://www.reuters.com/article/2014/05/23/us-usa-epa-ethanol-idUSKBN0E311S20140523>

## **“Harrison Hub plant for Utica liquids at Scio is still growing”**

By Bob Downing, *Akron Beacon Journal* (blog), May 24, 2014

OHIO - SCIO: The Beast is getting bigger.

The Beast is the term that Texas-based Momentum Midstream spokesman Eric Mize lovingly uses to describe the new and growing liquids-separating complex in northern Harrison County.

He also refers to the sprawling facility as the Big Boy. "It is a big plant, a very big plant and far bigger than other plants around here.... What's really amazing that we got it up and running in six months. No one believed that we could do that."

The facility, part of \$1.6 billion three-plant processing complex, sits at the edge of tiny Scio with its 760 residents and one traffic signal.

The so-called fractionation plant is designed to separate the natural gas liquids that come from Ohio's Utica shale, store it and ship it. The plant is a mile long and half mile wide.

The Scio plant processes 90,000 barrels a day today and that volume will soon be growing again.

It is one of two liquids-separating plants in eastern Ohio that are needed by midstream or processing companies to separate liquids and get them to market. It is added evidence that Ohio's shale boom is real.

Such liquids can produce revenue of \$60 or more per barrel, and that makes them very lucrative for energy companies. Those Ohio liquids are expected to produce \$450 million in revenues in 2014, separate from natural gas and oil.

The other Ohio liquids-processing plant was built by MarkWest Energy Partners in Jewett in Harrison County with 60,000 barrels per day of capacity. That Hopedale Complex will have an additional 78,000 barrels available by late 2014.

Construction on the 1.2-mile-long Scio complex began in January 2013 and it was up and running six months later. It was officially dedicated last October.

Read more: <http://www.ohio.com/blogs/drilling/ohio-utica-shale-1.291290/harrison-hub-plant-for-utica-liquids-at-scio-is-still-growing-1.489388>

## **“FL Researchers Look to Sweet Sorghum for Ethanol”**

By John Davis, *Domestic Fuel*, May 27, 2014

A partnership between a university and a private company is researching using sweet sorghum for ethanol. This story from Ethanol Producer Magazine says U.S. EnviroFuels LLC and the University of Florida could use the technology in the company’s 30 MMgy advanced ethanol plant under construction in Florida.

A research team from the University of Florida was awarded a four-year, \$5.4 million USDA grant to study the crop’s potential as an energy source earlier in May. Multiple varieties will be developed and assessed, looking at water consumption needs, growth in Florida soil, heat tolerance and the tolerance to disease and pests. Cellulosic ethanol will also be produced using a genetically engineered bacteria developed at the University of Florida.

The research project is good news for the proposed ethanol plant, which is behind schedule for construction and startup, said Bradley Krohn, president and chief technical officer of U.S. EnviroFuels, founder and project manager of Highlands EnviroFuels LLC. “Any R&D program that develops commercial sweet sorghum hybrids and improves the performance of sweet sorghum from a tonnage and sugar production standpoint will help the ethanol plant project going forward,” he said.

Read more: <http://domesticfuel.com/2014/05/27/fl-researchers-look-to-sweet-sorghum-for-ethanol/>

## **“Exxon Ships First Cargo From The PNG LNG Project, Strengthening Liquids Portfolio”**

By Trefis Team, Contributor, *Forbes*, May 27, 2014

Exxon Mobil recently shipped its first liquefied natural gas cargo from the Papua New Guinea LNG project months ahead of schedule. Production from the first LNG train started last month. Recently, the second train also started producing liquefied form of the cleaner burning hydrocarbon fuel as additional upstream wells came online. This start-up falls in line with Exxon Mobil’s current strategy of boosting the proportion of liquids (crude oil, natural gas liquids, bitumen and synthetic oil) and LNG in its portfolio for better margins.

We currently have a \$96 price estimate for Exxon Mobil, which values it at around 11.9x our 2014 GAAP diluted EPS estimate of \$8.05 for the company.

Exxon holds a 33.2% operating stake in the \$19 billion PNG LNG project. It is a 6.9 million ton per annum integrated LNG project operated by Esso Highlands Limited, a subsidiary of Exxon Mobil Corporation. It is expected to produce over 9 trillion cubic feet (tcf) of gas and 200 million barrels of associated liquids over its life. The gas is being sourced from the Hides, Angore and Juha gas fields, and from associated gas in the Kutubu, Agogo, Moran and Gobe Main oil fields. After being liquefied at the LNG plant, the gas is loaded onto ocean-going tankers to be shipped to the key Asian LNG markets.

The share of LNG in global natural gas trade has grown steadily over the past few years, primarily due to the fact that natural gas imports by Asian markets, which rely mostly on LNG (~80%), have been growing at a much faster rate than the rest of the world. Therefore, being located closer to the center of demand is a key advantage for the PNG LNG project over many other upcoming projects around the world, as lower transportation costs reduce the total per unit cost of delivered LNG. By our estimates, shipping LNG from PNG to Japan would cost anywhere between \$0.5 to \$1 per million British thermal units, cheaper than the upcoming LNG projects on the U.S. Gulf Coast and East Africa. (See: What’s Driving The Global LNG Demand)

Read more: <http://www.forbes.com/sites/greatspeculations/2014/05/27/exxon-ships-first-cargo-from-the-png-lng-project-strengthening-liquids-portfolio/>

## **“EPA mulls ethanol change as industry profits soar”**

*Iowa Farmer Today*, May 27, 2014

DES MOINES (AP) — Just as ethanol producers have been seeing the industry’s most-profitable months ever, the federal government is considering whether to lower the amount of the fuel that must be blended into gasoline.

That could be a serious blow to a biofuels industry that saw booms and busts connected to corn and petroleum prices before a Renewable Fuel Standard (RFS) approved by Congress in 2007 acted as a stabilizing factor.

The law, designed to reduce the nation's reliance on foreign oil and cut automobile emissions, increased the amount of ethanol required to be used each year, setting the standard at 14.4 billion gallons of corn-based ethanol for this year. In November, however, the EPA proposed the first rollback since the standard was enacted, to 13 billion gal.

“There are several factors in play and those factors are constantly changing the demand for fuel,” said Bob Perciasepe, deputy administrator of the EPA who was in Des Moines recently for a meeting of President Barack Obama's task force on climate change. EPA officials say fewer gallons of ethanol are necessary because the fuel efficiency of cars improved faster than expected, helping lower fuel demand. The U.S. consumed about 134 billion gal. of gasoline last year, about 6 percent less than the record high of about 142 billion gal. in 2007, according to the U.S. Energy Information Administration.

The EPA, which has received more than 343,000 comments on its proposal, plans to reach a final decision in late June.

Frustrating for the ethanol industry is the EPA's recommendation came just as ethanol was hitting its stride in profitability.

Scott Irwin, an agricultural marketing professor at the University of Illinois, estimated a model plant in Iowa would have earned a weekly profit of \$2.55 per bushel of corn processed in the first week of December, before a run-up that peaked at the highest weekly ethanol profit ever of \$4.50/bu. for the last week of March. Profits have since dropped to \$1.45/bu. for the first week of May, according to Irwin's figures.

By comparison, the average ethanol plant profit from 2007 to 2013 was 20 cents/bu.

The model used to compute the profit was designed at Iowa State University to be representative of the average ethanol plant built in the past five years based on production capacity, construction costs, debt, fixed costs and other factors.

Read more: [http://www.iowafarmertoday.com/news/crop/epa-mulls-ethanol-change-as-industry-profits-soar/article\\_815a0578-e5d6-11e3-92d0-0019bb2963f4.html](http://www.iowafarmertoday.com/news/crop/epa-mulls-ethanol-change-as-industry-profits-soar/article_815a0578-e5d6-11e3-92d0-0019bb2963f4.html)

## **“Vireol ethanol plant in Hopewell begins operations”**

*Richmond Times-Dispatch*, May 27, 2014

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Business News from the AP Hopewell ethanol plant operating again

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.Posted: Tuesday, May 27, 2014 9:21 am | Updated: 7:07 pm, Wed May 28, 2014.

Hopewell ethanol plant operating again Associated Press |

An ethanol plant in Hopewell that sat idle since 2010 has begun operation under its new owner.

Vireol Bio Energy LLC originally planned to dismantle the plant and ship the equipment to its plant in England. The company reconsidered and decided to open the plant after production slowed in England.

Hopewell City Manager Mark Haley said Vireol's CEO told him recently that the plant has produced about 1 million gallons of ethanol.

Osage Bio Energy completed the plant in 2010 but never opened it. Vireol's investor, Future Capital Partners, later bought the plant for \$13 million.

Read more: [http://www.timesdispatch.com/business/ap/vireol-ethanol-plant-in-hopewell-begins-operations/article\\_ce01c2a6-e5a1-11e3-ac6d-001a4bcf6878.html](http://www.timesdispatch.com/business/ap/vireol-ethanol-plant-in-hopewell-begins-operations/article_ce01c2a6-e5a1-11e3-ac6d-001a4bcf6878.html)