

“A new catalyst for low-cost production of biodiesel fuel”

By Tetsuo Satoh, *Chemical Engineering*, November 1, 2013

Daiki Axis Co. (Matsuyama City, Japan; www.daiki-axis.com) has developed a new solid catalyst for biodiesel fuel production under the support of New Energy and Industrial Technology Development Organization (NEDO) under the authority of the Ministry of Economy, Trade and Industry (METI). The company's new catalyst, tradenamed DX-G1, acts as a bi-functional catalyst — simultaneously as both acid catalyst and alkaline catalyst — for the synthesis of fatty acid methyl ester (FAME). DX-G1 is a pellet-type catalyst that is insoluble in water and acidic media, and enables the synthesis of FAME in a single-step reaction whereby fatty oils and methanol flow through a packed-bed reactor.

FAME yields of more than 98% have been observed with DX-G1, compared to 85% yields using conventional homogeneous catalysts. The solid catalyst can be easily recovered and reused, and the product contains no residual catalyst or soaps, which enables fast separation of the high-purity (95%) byproduct, glycerin. Eliminating the washing steps needed to remove homogeneous catalysts also means less wastewater generated. These features combine to reduce production costs by 30%, says the company. The catalyst can be used continuously for more than two years in a fixed bed. In contrast, the homogeneous catalysts used in conventional batch or semi-batch processes are used only once.

Read more:

<http://www.che.com/nl/YToyOntpOjA7czo1OiIxMTEzMSI7aToxO3M6MTE6ImNoZW11bnRh dG9yIjt9/>

“Velocys announce that it has entered a joint venture with Waste Management, NRG Energy, and Ventech Engineers”

OilVoice, March 24, 2014

Velocys plc (VLS.L), the technology innovator for smaller scale gas-to-liquids (GTL), is pleased to announce that it has entered a joint venture (JV) with Waste Management, NRG Energy (NRG), and Ventech Engineers International (Ventech) to develop gas-to-liquids (GTL) plants in the United States and other select geographies.

The JV will pursue the development of multiple plants utilising a combination of renewable biogas (including landfill gas) and natural gas. Waste Management intends to supply renewable

gas and, in certain cases, project sites. All four members will work exclusively through the JV to pursue the intended application (GTL using renewable gas, optionally in conjunction with natural gas) in the United States, Canada, United Kingdom and China.

As its first commercial facility, the JV is targeting a plant to be located at Waste Management's East Oak landfill site in Oklahoma, US. Detailed engineering for this first project is being completed, while final draft permitting documents for the facility have been submitted. The JV intends making a final decision to proceed on this first plant this year. Development activities for additional facilities are expected to commence shortly.

Read more:

http://www.oilvoice.com/n/Velocys_announce_that_it_has_entered_a_joint_venture_with_Waste_Management_NRG_Energy_and_Ventech_Engineers_International/d8dd98c860f8.aspx#gsc.tab=0

Related article*

*** “Velocys in GTL joint venture”**

By Stuart Radnedge, *GasWorld*, April 8, 2014

Read more: <http://www.gasworld.com/news/regions/north-america/velocys-in-gtl-joint-venture/2003609.article>

“Ethanol proposal has stopped investments in advanced biofuels, industry tells senators”

By Christopher Doering, *The Des Moines Register*, April 8, 2014

The Obama administration has halted investments in advanced biofuels plants following its proposal last year to reduce how much renewable fuels must be blended into the country's fuel supply in 2014, an executive representing the industry told Senate lawmakers Tuesday.

"What the (Environmental Protection Agency) proposal did, first the leaked version in October and then in November is frozen everything," Brooke Coleman, executive director of the Advanced Ethanol Council, told sympathetic lawmakers on the Senate Agriculture Committee. "Every single one of my companies. There are no exceptions."

The EPA, which oversees the country's Renewable Fuel Standard, proposed in November cutting the fuel requirement in 2014 to 15.2 billion gallons of ethanol and other biofuels, 3 billion gallons less than Congress required in a 2007 law. As part of that, EPA proposed requiring 2.2 billion gallons of advanced biofuels, including agricultural waste, wood and grass, to be used in 2014, far below the 3.75 billion outlined in federal law.

Read more: <http://www.desmoinesregister.com/story/news/politics/2014/04/08/ethanol-congress-investments/7467263/>

“Composite natural gas liquids prices fell over 20% since February”

By Ingrid Pan, CFA, *MarketRealist*, April 8, 2014

Natural gas liquids, or NGLs, are a group of hydrocarbons (ethane, propane, butanes, and pentanes) that are often found alongside dry natural gas (methane). Many upstream companies (companies that produce crude oil and natural gas) garner much of their revenue from producing and selling NGLs—especially those that have a significant amount of “rich gas” assets, or natural gas assets “rich” in liquids. Some of these companies include Range Resources (RRC), Chesapeake Energy (CHK), SM Energy (SM), and Linn Energy (LINE). Price fluctuations in NGLs can affect the ultimate revenue and earnings of upstream companies, so NGL prices are an important indicator to track in the energy sector.

According to a presentation by the Midstream Energy Group, the average NGL barrel composition in December 2011 was ~43% ethane, ~28% propane, ~7% normal butane, ~9% isobutane, and ~13% pentanes or heavier hydrocarbons. Using this representative composite barrel, NGL prices closed slightly lower at \$38.56 per barrel on April 4, compared to \$38.79 per barrel for the week ended March 28.

Ethane, the largest portion of the natural gas liquids barrel, traded slightly lower, from \$0.29 per gallon to \$0.28 per gallon. Meanwhile, propane, the second largest portion of the barrel, traded from \$1.06 per gallon to \$1.08 per gallon. Butane traded flat on the week, to close at \$1.21 per gallon. Natural gasoline, the highest value portion of the NGL stream (on a per-gallon basis), however, traded down from \$2.28 per gallon to \$2.24 per gallon. Ultimately, the composite NGL barrel traded slightly lower on the week.

Read more: http://marketrealist.com/analysis/etf-analysis/commodity-etfs/energy-commodities/charts/?featured_post=49854&featured_chart=49855

“LIMS Simplifies World’s Largest Gas-to-Liquids Plant”

By Colin Thurston, Project Director, Informatics, Thermo Fisher Scientific, Inc., Waltham, Mass, *Laboratory Equipment*, April 8, 2014

An information and data management system helps the world’s largest GTL plant adhere to the highest standards of safety, quality, compliance and profitability.

There are no shortages of world records when it comes to Pearl GTL. The facility, located 80 kilometers north of Doha, Qatar, includes the largest gas-to-liquids (GTL) plant and one of the largest instrumentation and control systems anywhere on earth. The facility became fully operational in 2012. The project, engineered by Shell and Qatar Petroleum, has the capacity to extract 1.6 billion cubic feet of gas per day from the North Field, which can be processed into 120,000 barrels per day of condensate and natural gas liquids and 140,000 barrels per day of GTL products.

The issues

The scale and diversity of Pearl GTL makes it an incredibly complex operation. It was clear from the beginning that Pearl GTL would need a highly sophisticated software solution to manage the data coming out of a quality control system that receives a constant stream of 34,000 transmitted measurements. These tests gauge well content, volume, emissions, equipment condition and hundreds of other issues integral to the plant's operation. In addition to collection and storage, the data also needed to be organized, integrated and analyzed to ensure product quality, plant and customer safety, environmental protection and production efficiency.

Read more: <http://www.laboratoryequipment.com/articles/2014/04/lims-simplifies-world%E2%80%99s-largest-gas-liquids-plant>

“Squandering America's Gas Bonanza”

By Gal Luft, *Journal of Energy Security*, April 8, 2014

The US is on the road to squander one of the biggest economic opportunities in its recent history. Since the beginning of the shale gas revolution in 2005 the American public has been primarily engaged in debates about the conditions under which hydraulic fracturing can take place and how much of the gas should be allocated for export. These questions are gradually being settled as more information on pros and cons of each option is gathered. But one important market for natural gas has been largely neglected - transportation.

In the absence of a serious public debate and readily available alternative domestic markets it is only natural that most of the cheap gas finds its way to the electricity sector, causing widespread displacement of coal fired generation. Coal's share of total electricity generation declined from 51% ten years ago to 40% today and this percentage will continue to fall as the Obama administration persists in its ban on new coal fired power plants. The shift from coal to gas has brought a 10% decline in US greenhouse gas emissions from power plants since 2010, negating the political pressure for costly carbon cap-and-trade schemes. The shale gas industry has also created numerous jobs, stimulated economic growth and reduced consumer costs of natural gas derived products. But all these benefits pale in comparison to what could be achieved should the gas be replacing oil instead of coal.

Read more:

http://www.ensec.org/index.php?option=com_content&view=article&id=532:squandering-america-gas-bonanza&catid=143:issue-content&Itemid=435

“Stanford scientists discover a novel way to make ethanol without corn or other plants”

By Mark Shwartz, *Stanford News*, April 9, 2014

Stanford scientists have created a copper-based catalyst that produces large quantities of ethanol from carbon monoxide gas at room temperature.

Stanford University scientists have found a new, highly efficient way to produce liquid ethanol from carbon monoxide gas. This promising discovery could provide an eco-friendly alternative to conventional ethanol production from corn and other crops, say the scientists. Their results are published in the April 9 advanced online edition of the journal *Nature*.

"We have discovered the first metal catalyst that can produce appreciable amounts of ethanol from carbon monoxide at room temperature and pressure – a notoriously difficult electrochemical reaction," said Matthew Kanan, an assistant professor of chemistry at Stanford and coauthor of the *Nature* study.

Most ethanol today is produced at high-temperature fermentation facilities that chemically convert corn, sugarcane and other plants into liquid fuel. But growing crops for biofuel requires thousands of acres of land and vast quantities of fertilizer and water. In some parts of the United States, it takes more than 800 gallons of water to grow a bushel of corn, which, in turn, yields about 3 gallons of ethanol.

The new technique developed by Kanan and Stanford graduate student Christina Li requires no fermentation and, if scaled up, could help address many of the land- and water-use issues surrounding ethanol production today. "Our study demonstrates the feasibility of making ethanol by electrocatalysis," Kanan said. "But we have a lot more work to do to make a device that is practical."

Read more: <http://news.stanford.edu/news/2014/april/ethanol-without-plants-040914.html>

“Is Minnesota the next battleground in the tar sands fight?”

By Dan Haugen, *Midwest Energy News*, April 11, 2014

Marty Cobenais has been to every state along the proposed Keystone XL pipeline route, organizing resistance to the project from Montana to Texas.

He's been arrested twice for civil disobedience during Keystone XL protests in front of the White House.

Now, the Bemidji man believes it's time for pipeline activists around the country to turn their attention to his own backyard in northern Minnesota.

A trio of major pipeline projects proposed by Canadian fuel transporter Enbridge have been moving forward in Minnesota, mostly below the national radar.

Read more: <http://www.midwestenergynews.com/2014/04/07/is-minnesota-the-next-battleground-in-the-tar-sands-fight/>

“Economics may hinder Berks County gas-to-liquids plant”

By Marie Cusick, *NPR StateImpact Pennsylvania*, April 11, 2014

A proposal to build a plant that would transform Pennsylvania’s cheap, abundant natural gas into more expensive motor fuel is generating controversy in Berks County. If built, the gas-to-liquids (GTL) plant would be one of the first facilities of its kind in the United States.

But industry analysts say there’s a reason these kinds of plants are so rare– the economics often don’t make a lot of sense.

“Homes all around”

Jen Byrne watches and worries as children run around the playground behind the day care she owns. If the plant is built in South Heidelberg Township, it would be—literally—in her backyard.

Jen Byrne owns SpringRose Childcare in Sinking Spring.

“I thought there’s no way they’d put that right there,” she says, looking out at the empty lot. “We have all these children here. There’s homes all around. My biggest concern is air and water pollution.”

The idea behind the GTL facility is to transform Pennsylvania’s natural gas into expensive liquid motor fuel—it would produce gasoline that can go right into a car.

The facility is projected to cost \$800 million to \$1 billion and produce about 500,000 gallons per day of gasoline and liquid petroleum. It’s planned for a 63-acre site about 10 miles west of Reading. Although the land is zoned for light industrial uses, it’s currently an empty field surrounded by residential neighborhoods.

Once word got out about the plans, a concerned citizens group quickly organized. They printed up bright red “Stop the gas refinery” yard signs, t-shirts, and flyers. Nearly 300 people attended a recent meeting hosted by the group.

A Canadian developer, EmberClear, is seeking to develop the GTL plant. Jim Palumbo is a project manager for the company. He says the plant will create about 150 permanent jobs.

Read more: <http://stateimpact.npr.org/pennsylvania/2014/04/11/economics-may-hinder-berks-county-gas-to-liquids-plant/>

“Study: Fuels from corn waste worse than gas”

By Dina Cappiello, *USA Today*, April 20, 2014

WASHINGTON (AP) — Biofuels made from the leftovers of harvested corn plants are worse than gasoline for global warming in the short term, a study shows, challenging the Obama administration's conclusions that they are a much cleaner oil alternative and will help fight climate change.

A \$500,000 study paid for by the federal government and released Sunday in the peer-reviewed journal *Nature Climate Change* concludes that biofuels made with corn residue release 7% more greenhouse gases in the early years compared with conventional gasoline.

While biofuels are better in the long run, the study says they won't meet a standard set in a 2007 energy law to qualify as renewable fuel.

The conclusions deal a blow to what are known as cellulosic biofuels, which have received more than \$1 billion in federal support but have struggled to meet volume targets mandated by law. About half of the initial market in cellulose is expected to be derived from corn residue.

The biofuel industry and administration officials immediately criticized the research as flawed. They said it was too simplistic in its analysis of carbon loss from soil, which can vary over a single field, and vastly overestimated how much residue farmers actually would remove once the market gets underway.

"The core analysis depicts an extreme scenario that no responsible farmer or business would ever employ because it would ruin both the land and the long-term supply of feedstock. It makes no agronomic or business sense," said Jan Koninckx, global business director for biorefineries at DuPont.

Read more: <http://www.usatoday.com/story/money/business/2014/04/20/study-fuels-from-corn-waste-not-better-than-gas/7941261/>

“Tension grows over Sunoco’s natural gas liquids pipeline to Marcus Hook”

By Katie Colaneri, *NPR StateImpact Pennsylvania*, April 25, 2014

The pump station on Boot Road at Route 202 in West Goshen Township has been around since the 1930s. It helps move jet fuel and heating oil through a pipeline that runs beneath the Chester County suburb.

Now, a plan to put in a new pump station to move natural gas liquids through a second pipeline that runs from the Marcellus Shale to Marcus Hook is being met with strong local resistance.

“We’re trying to stop them from implementing a production facility in a residential neighborhood,” said Allen Feinberg. “If it was in a proper zone and in an industrial zone, no one would have fought it.”

Feinberg and his wife Alexandra Alexander live on Mary Jane Lane, which runs borders the site where Sunoco Logistics LP — Sunoco’s pipeline arm — plans to build the second pump station on a property that’s currently zoned residential.

While she was never concerned about the original pump station, Alexander said the new one would be about 250 feet from her back door. She’s worried about emissions from a 30-foot flaring unit that would be used to burn off excess fuel during maintenance and about the potential for a major failure.

“I’m right within the blast zone,” Alexander said. “If it blows up, my house goes.”

Company files for exemption from local zoning

About 250 residents showed up at a forum at West Goshen East High School on Tuesday night where 11 Sunoco Logistics officials took questions and gave an overview of the Mariner East project.

“We want to peacefully and cooperatively co-exist,” Hank Alexander, Sunoco Logistics’ vice president of business development told the crowd.

However, residents who have organized in opposition to the plan see the company’s actions as anything but cooperative.

Sunoco Logistics has filed petitions with the Public Utility Commission to be recognized as a “public utility corporation,” allowing them to bypass local zoning laws to build pump and valve stations in 31 towns along the pipeline’s nearly 300-mile route — including West Goshen.

That has raised the ire of two state senators, Andy Dinniman (D-Chester) and John Rafferty Jr. (R-Montgomery), who wrote a letter arguing Sunoco Logistics is ignoring the state Supreme Court’s ruling on Act 13, which “affirm[ed] local governments’ right to regulate pipelines, affiliated pumping and valve stations, and other oil and gas operations.”

Read more: <http://stateimpact.npr.org/pennsylvania/2014/04/25/tension-grows-over-sunocos-natural-gas-liquids-pipeline-to-marcus-hook/>

“New hope for brown coal?”

By Louis Nelson, *Latrobe Valley Express*, April 28, 2014

(Australia) The hunt for the holy grail of brown coal power generation is set to head to Japan, where a "world-first" trial will run 20 tonnes of Latrobe Valley coal slurry through a large diesel engine.

Coming as part of the Brown Coal Innovation Australia's latest competitive funding round for low emission generation technology, worth \$2.45 million, the CSIRO's 'Direct Injection Carbon

Engine' research has secured a further \$1 million to push the project toward a new three-year program.

The DICE technology injects a water-based coal slurry directly into large adapted diesel engines for electricity generation and is hoped to reduced carbon emissions by 50 per cent from the Valley's existing power stations.

Emerging as somewhat of a poster child for new coal technologies, Federal Environment Minister Greg Hunt last October used DICE's potential to justify his view the Valley's power industry could halve its carbon emissions in 10 years.

Read more: <http://www.latrobevalleyexpress.com.au/story/2244155/new-hope-for-brown-coal/?cs=1210>

“New solar reactor technology to produce liquid hydrocarbon fuels”

Provided by ETH Zurich, *Phys.Org*, April 28, 2014

With the first ever production of synthesized "solar" jet fuel, the SOLAR-JET project has successfully demonstrated the entire production chain for renewable kerosene obtained directly from sunlight, water and carbon dioxide (CO₂), therein potentially revolutionizing the future of aviation. This process has also the potential to produce any other type of fuel for transport applications, such as diesel, gasoline or pure hydrogen in a more sustainable way.

Several notable research organizations from academia through to industry (ETH Zürich, Bauhaus Luftfahrt, Deutsches Zentrum für Luft- und Raumfahrt (DLR), ARTTIC and Shell Global Solutions) have explored a thermochemical pathway driven by concentrated solar energy. A new solar reactor technology has been pioneered to produce liquid hydrocarbon fuels suitable for more sustainable transportation.

"Increasing environmental and supply security issues are leading the aviation sector to seek alternative fuels which can be used interchangeably with today's jet fuel, so-called drop-in solutions", states Dr. Andreas Sizmann, the project coordinator at Bauhaus Luftfahrt. "With this first-ever proof-of-concept for 'solar' kerosene, the SOLAR-JET project has made a major step towards truly sustainable fuels with virtually unlimited feedstocks in the future.

The SOLAR-JET project demonstrated an innovative process technology using concentrated sunlight to convert carbon dioxide and water to a so-called synthesis gas (syngas). This is accomplished by means of a redox cycle with metal-oxide based materials at high temperatures. The syngas, a mixture of hydrogen and carbon monoxide, is finally converted into kerosene by using commercial Fischer-Tropsch technology.

Read more: <http://phys.org/news/2014-04-solar-reactor-technology-liquid-hydrocarbon.html>