

“GTL ’14: Fluor suggests GTL units inside refineries”

By Ben DuBose, *Hydrocarbon Processing*, July 30, 2014

Speaking at the GTL Technology Forum, Paul Koppel outlined the economic problems with many current GTL proposals and how increased synergies can help push the projects forward.

HOUSTON – There are several economic benefits to placing gas-to-liquids (GTL) units within existing refineries, the vice president of process technology at contracting firm Fluor said on Wednesday.

Speaking at the GTL Technology Forum, Paul Koppel outlined the economic problems with many current GTL proposals and explained how increased synergies can help push the projects forward.

“Most project developers are new organizations that don’t have a track record,” he said. “Many of the technologies are new and unproven commercially. Bankers don’t look kindly on that.

“So who will take the risk?”

By working in tandem with existing refineries, some of that risk can be mitigated, Koppel said. Benefits to placing a GTL unit inside a refinery include the possibility of using excess syngas capacity, the potential availability of CO₂, the use of a hydrocracker for upgrading, and the availability of existing utilities, offsites and services.

“If syngas production, a hydrocracker and services are available, total investment cost can be reduced by 75 percent,” Koppel said.

“Even if syngas is unavailable, you can still reduce cost by about 45 percent, we’ve found.”

The tradeoff would be that the feedstock natural gas is indexed to the Henry Hub price, which currently averages near \$4/MMBtu, rather than natural gas in remote areas, which runs from \$0-\$2/MMBtu, Koppel explained. However, the synergies in other areas could offer the appearance of a more broad economic stability

Read more: <http://www.hydrocarbonprocessing.com/Article/3366699/GTL-14-Fluor-suggests-GTL-units-inside-refineries.html>

“Construction approved on new Oklahoma GTL plant”

Hydrocarbon Processing, July 30, 2014

The project is being funded by a joint venture between Waste Management, NRG Energy (NRG), Ventech Engineers International (Ventech) and Velocys, formed to develop a series of GTL plants.

Velocys, the technology innovator for smaller scale gas-to-liquids (GTL), reached a final investment decision (FID) to proceed with construction of a commercial GTL plant using the company's technology.

The project is being funded by a joint venture (JV) between Waste Management, NRG Energy (NRG), Ventech Engineers International (Ventech) and Velocys, formed to develop a series of GTL plants in the US and other select geographies.

The plant, which is designed to be profitable on a standalone basis, will be located at Waste Management's East Oak landfill site in Oklahoma. It will provide a commercial reference site for the Velocys technology and will deploy a number of the company's full scale Fischer-Tropsch reactors.

Purchase of major equipment has begun, with construction and commissioning to be complete, and the plant entering full commercial operation, in less than 24 months, according to company officials.

Read more: <http://www.hydrocarbonprocessing.com/Article/3366385/Construction-approved-on-new-Oklahoma-GTL-plant.html>

Related article*

*** “Oklahoma GTL plant “go-ahead”**

By Stuart Radnedge, *GasWorld*, July 31, 2014

Read more: <http://www.gasworld.com/news/oklahoma-gtl-plant-go-ahead/2004113.article>

*** “Velocys announces commercial-scale GTL plant gets go-ahead”**

By Velocys plc, *Biomass Magazine*, August 1, 2014

Read more: <http://biomassmagazine.com/articles/10735/velocys-announces-commercial-scale-gtl-plant-gets-go-ahead>

“GTL ’14: Executive insight into new gas-to-liquids technologies”

By Adrienne Blume, *Hydrocarbon Processing*, July 31, 2014

HOUSTON -- Gulf Publishing Company's second annual Gas-to-Liquids (GTL) Technology Forum opened on July 30 and concluded on Thursday, July 31. Speakers and attendees shared insight on gas processing technology developments, project economics and business challenges. A full news recap of technical sessions and photo gallery are included below:

DAY 2 SESSION ROUNDUP

Day 2 of the second annual GTL Technology Forum, which drew nearly 200 attendees from the US and a number of other countries, opened with an ExxonMobil-sponsored networking breakfast in the exhibition hall. Exhibitors Pentair, Siemens, AMACS, Walter Tosto and Ariel discussed their products and services with forum delegates over coffee, pastries and fruit.

EIA assessment of US GTL. After the breakfast, Vishakh Mantri of the US Energy Information Administration (EIA) delivered a keynote presentation on the economics of GTL conversion technologies.

Dr. Mantri reviewed the EIA's Annual Energy Outlook research methodology and how the government body makes its projections. He then discussed why natural gas is an ideal fossil fuel in terms of emissions, sulfur content and available infrastructure, and what other fuels are competing with GTL fuels. Competing fuels include petroleum fuels refined from crude oil, CNG, LNG, and plant-based biofuels....

DAY 1 SESSION ROUNDUP

Session 1: Syngas. The technology sessions of the Day 1 agenda kicked off with an introduction by V. K. Arora, director of process and operations at Kinetics Process Improvements, who served as the session chair for the syngas portion of the program.

Autothermal reforming. In one part of the syngas session, Soren Martin Olsen, sales manager for Haldor Topsøe, talked about autothermal reforming (ATR) as a preferred technology for the conversion of natural gas to syngas in industrial GTL applications. The price gap between gas and oil is rising, so the incentive for converting gas into chemicals and transportation fuels—such as methanol, gasoline and diesel—is increasing, Mr. Olsen explained.

ATR technology, which has been in industrial operation for over 10 years, includes optimized catalysts and loading schemes. The world's top ATR units are in operation at the Oryx GTL plant in Qatar. Improvements to the ATR technology have been continuously implemented. Today, both the technology and operation are stable and robust, with good carbon efficiency and an excellent onstream factor, Mr. Soren said.

Read more: <http://www.hydrocarbonprocessing.com/Article/3366752/GTL-14-Executive-insight-into-new-gas-to-liquids-technologies.html>

“Fuel Stability Problems Challenge FAME Biodiesel”

By Edward Dodge, *Energy Collective*, August 1, 2014

Fuel stability woes challenge the increase of FAME (Fatty Acid Methyl Ester) biodiesel beyond the current B5, or 5% blend. Mercedes-Benz and some other original engine manufacturers (OEM's) will not warranty their engines when blends of B6 or higher are used. The reason is due to poor oxidation stability that causes the fuel to biodegrade over time. This process is amplified due to improper storage and handling along the retail fuel distribution chain. Fuels that are in spec at the time of blending have shown degradations in quality as they move out through retailers. The results of oxidation can include bacterial growth in gas tanks and sludging of engines, fuel injectors and fuel filters.

FAME biodiesel is the most popular type of alternative diesel fuel available today. FAME biodiesel is produced through transesterification of fats with methanol, the fats are obtained from vegetable oils or other fatty acids such as animal fats or waste cooking oils. Biodiesel is hygroscopic, meaning that it attracts moisture and once moisture sets in it can hydrolyze and form a variety of organic acids and bacteria. The main problem with FAME biodiesel is low oxidative stability meaning that it does not store well over time relative to petroleum diesel leading to the buildup of acids and sediments. Factors affecting oxidative stability include the degree of saturation of the feedstock, level of natural antioxidants, carbon chain length and the presence of glycerides.

Read more: <http://theenergycollective.com/jared-anderson/450416/fuel-stability-problems-challenge-fame-biodiesel>

“Graphene Surprises By Decomposing”

By Mitch Jacoby, *C&EN (Chemical & Engineering News)*, August 4, 2014

Graphene's hallmark chemical stability has made this ultrathin carbon network an ideal support material in catalysis and energy studies. But that inertness is now being called into question by an investigation showing that the material can decompose when used in common applications (Chem. Mater. 2014, DOI: 10.1021/cm5026552).

Water-dispersible forms of graphene are easy to make and easy to handle via simple wet-chemistry methods. Large numbers of researchers use the materials to support nanoparticle catalysts for use in environmental remediation, solar cells, and fuel cells.

For such applications, scientists often use a solution-phase form of graphene called reduced graphene oxide. RGO is made by chemically reducing graphene oxide, a common starting material. RGO's conductivity and bonding characteristics are credited with the high level of catalytic activity it promotes.

But this highly touted material may not stand up to repeated use. University of Notre Dame scientists have shown that aqueous suspensions of RGO-supported TiO₂ nanoparticles unexpectedly undergo decomposition. Specifically, James G. Radich, Prashant V. Kamat, and

colleagues demonstrate that upon exposure to ultraviolet light, the nanoparticle surfaces generate hydroxyl radicals, which oxidatively attack RGO.

On the basis of spectroscopy and microscopy analyses and total-organic-carbon measurements, the group explains that UV radiation triggers a fragmentation process that breaks the RGO sheets into polyaromatic hydrocarbon (PAH)-like compounds. Prolonged irradiation eventually decomposes the organic compounds completely, leaving behind CO₂ and water.

Read more: <http://cen.acs.org/articles/92/i31/Graphene-Surprises-Decomposing.html>

“Small gas-to-liquids plant planned for former Houston power plant site”

By Rhiannon Meyers, *FuelFix*, August 4, 2014

Biofuels Power Corp. plans to build a small-scale plant to convert natural gas to synthetic crude on a former power plant site about 10 miles south of downtown Houston as it looks to capitalize on abundant supplies of cheap natural gas, the company announced Monday.

The gas-to-liquids plant is a pilot project, the first step in the Humble-based company’s plans to build several small plants at oil fields across the U.S. to capture and convert natural gas now stranded at well sites that don’t have processing or transportation infrastructure to carry the gas to market.

Advances in hydraulic fracturing and horizontal drilling have unlocked vast quantities of natural gas from dense rock formations, but producers have to burn off stranded gas for lack of a way to transport and sell it.

With its demonstration project, Biofuels Power Corp. hopes to show that small-scale gas-to-liquids plants are commercially viable alternatives for companies curtailing or stopping natural gas production because it’s too expensive to expand and build infrastructure to gather, process and transmit natural gas.

New legislation regulating flaring make such projects even more attractive, Biofuels Power Corp. said.

Read more: <http://fuelfix.com/blog/2014/08/04/small-gas-to-liquids-plant-planned-for-former-houston-power-plant-site/>

Related article*

*** “Biofuels Power to build GTL pilot plant in Houston”**

Hydrocarbon Processing, August 5, 2014

Read more: <http://www.hydrocarbonprocessing.com/Article/3368207/Biofuels-Power-to-build-GTL-pilot-plant-in-Houston.html>

“Canada-US pipeline may spark more emissions than expected”

MSN News, August 10, 2014

A proposed pipeline from Canada to the United States may result in much higher greenhouse gas emissions than previously calculated as it could fuel greater oil consumption through higher production and lower prices, a study said Sunday.

Researchers from the Stockholm Environment Institute used a mathematical model to estimate the Keystone XL pipeline's potential for atmospheric pollution.

Unlike calculations by the US State Department, they took into account a possible consumption rise in line with production, the pair wrote in the journal *Nature Climate Change*.

It was not clear, though, what the production increase was likely to be.

Using basic supply-and-demand economic principles and assuming a rise in production, the team calculated the pipeline would yield greenhouse gas emissions of 100-110 million tonnes of carbon dioxide equivalent (MtCO₂e) per year -- "four times the upper State Department estimate" of 27.4 MtCO₂e, they said.

The Keystone XL project to carry oil sands crude from Canada to refineries along the US Gulf Coast, has pitted environmental groups against the oil industry, which argues it will bring much-needed jobs and help fulfil the US goal of energy self-sufficiency.

Read more: <http://news.msn.com/us/canada-us-pipeline-may-spark-more-emissions-than-expected>

“Proposed PennEast pipeline through Mercer, Hunterdon counties runs into opposition”

By Brendan McGrath | *Times of Trenton, NJ.com*, August 12, 2014

Residents in Mercer and Hunterdon counties could see a 30-inch wide natural gas pipeline run a few dozen miles through local towns if a \$1 billion proposal from a Pennsylvania company is approved by federal regulators.

PennEast Pipeline Co. LLC announced its plans for the pipeline today and received almost immediate opposition from the New Jersey branch of the Sierra Club.

The preliminary proposal indicates that the pipeline would carry natural gas from a distribution center north of Wilkes-Barre, Pa., and through four counties in Pennsylvania before crossing the Delaware River and running through western Hunterdon County and into the Hopewell Valley area of Mercer County. Officials from the company said repeatedly that this path could change.

The proposed PennEast route would run parallel to the planned Williams Transcontinental pipeline, which would cut through nearby Montgomery and Princeton. That line is currently in the federal approval process.

Patricia Kornick, a PennEast spokeswoman, said that the pipeline will bring customers in New Jersey lower, more stable natural gas prices.

“Pipeline companies don’t want to be in residential areas any more than people want them in residential areas,” Kornick said.

The benefits of having the pipeline, however, will outweigh the effects of building it, Kornick said.

Kornick said that while New Jersey natural gas prices have reached as high as \$100 per dekatherm, a common unit of measurement in the industry, prices in the Marcellus Shale region were in the single digits. The Marcellus Shale is a rock formation underpinning much of the Appalachians, from New York to southern Virginia, that is rich in natural gas.

Read more:

http://www.nj.com/mercer/index.ssf/2014/08/proposed_penneast_pipeline_through_mercer_hunterdon_counties_runs_into_opposition.html

“New energy-rich sorghum offers ethanol without the corn”

By Marc Gunther, *The Guardian*, August 12, 2014

California startup NexSteppe presents a new brand of sorghum, bred for optimal energy production, designed as a greener alternative to corn for ethanol fuels and biomass boilers

As scientists around the world research biomass feedstocks — trees, shrubs and grasses that are designed to produce energy — a California startup called NexSteppe is betting that fast-growing, drought-resistant sorghum will emerge as a crop to sustainably fuel cars, trucks and power plants.

Sorghum, a millenia-old cereal grain, today feeds animals and people. It is turned into flour, syrups and beer, and used in gluten-free products. In Asia, sorghum is made into couscous, and across Africa, it’s consumed as a porridge.

Last year, though, NexSteppe introduced two new brands of sorghum seeds, dubbed Palo Alto and Malibu, that were bred expressly to be energy crops. They grow on marginal land and in a variety of climates, and they climb to a height of 20 feet after only four months of growth.

“Sorghum is naturally very heat and drought tolerant,” says Anna Rath, NexSteppe’s founder, president and CEO. “It originated in Africa. It’s a camel of a crop, if you will.”

Although NexSteppe has done almost no marketing outside of Brazil, its biggest market, the company's sorghum is now being grown by farmers in 15 countries, including China, India, South Africa, Germany, Canada and the US.

Read more: <http://www.theguardian.com/sustainable-business/2014/aug/12/biofuels-energy-efficient-sorghum-nexsteppe>

“API urges EPA to expedite 2014 RFS requirements”

By OGJ editors, *Oil & Gas Journal*, August 13, 2014

The American Petroleum Institute once again has called on the US Environmental Protection Agency to transcend its pattern of missing self-pronounced deadlines and to finalize requirements under the federal 2014 Renewable Fuels Standard (RFS) as soon as possible (OGJ Online, June 18, 2014).

“EPA still hasn't finalized the RFS requirements for this year, leaving companies to guess how much ethanol they must blend into gasoline,” said Patrick Kelly, senior policy advisor at API.

API's call on the federal agency came as the industry group marked the 1-year anniversary on Aug. 6 of EPA's finalization of 2013 RFS requirements, which were delayed by more than 8 months.

While EPA missed its deadline for finalizing 2012 RFS requirements by only a month, its extended delay in meeting the deadline for issuing the 2013 final rule will be exceeded even further this year, with 2014 RFS final standards presently on track to be as late as 9 months or more, according to API.

“This is the longest, most unreasonable delay in a history of long, unreasonable delays when it comes to implementing the RFS under this administration,” Kelly said, emphasizing that the agency has not released RFS requirements on time since 2011.

The delay, API argues, could harm consumers by driving up compliance costs for refiners and making it harder for them to produce fuels to meet US demand.

Earlier in the month, a source at EPA told OGJ that the agency was still working on the 2014 RFS final standards in an attempt “to get them right” to achieve the goal of putting the RFS program “on a manageable path that supports continued, achievable, realistic growth in renewable fuels” (OGJ Online, Aug. 1, 2014).

Read more: <http://www.ogj.com/articles/2014/08/api-urges-epa-to-expedite-2014-rfs-requirements.html>

“Bionic liquids from lignin: New results pave the way for closed loop biofuel refineries”

Provided by Lawrence Berkeley National Laboratory, *Phys.org*, August 18, 2014

(Phys.org) —While the powerful solvents known as ionic liquids show great promise for liberating fermentable sugars from lignocellulose and improving the economics of advanced biofuels, an even more promising candidate is on the horizon – bionic liquids.

Researchers at the U.S. Department of Energy's Joint BioEnergy Institute (JBEI) have developed "bionic liquids" from lignin and hemicellulose, two by-products of biofuel production from biorefineries. JBEI is a multi-institutional partnership led by Lawrence Berkeley National Laboratory (Berkeley Lab) that was established by the DOE Office of Science to accelerate the development of advanced, next-generation biofuels.

"What if we could turn what is now a bane to the bioenergy industry into a boon?" says Blake Simmons, a chemical engineer who is JBEI's Chief Science and Technology Officer and heads JBEI's Deconstruction Division. "Lignin is viewed as a waste stream that is typically burned to generate heat and electricity for the biorefinery, but if other uses for lignin could be found with higher economic value it would significantly improve the refinery's overall economics. Our concept of bionic liquids opens the door to realizing a closed-loop process for future lignocellulosic biorefineries, and has far-reaching economic impacts for other ionic liquid-based process technologies that currently use ionic liquids synthesized from petroleum sources."

Simmons and Seema Singh, who directs JBEI's biomass pretreatment program, are the corresponding authors of a paper describing this research in the Proceedings of the National Academy of Sciences (PNAS). The paper is titled "Efficient biomass pretreatment using ionic liquids derived from lignin and hemicellulose." The lead author is Aaron Socha. Other co-authors are Ramakrishnan Parthasarathi, Jian Shi, Sivakumar Pattathil, Dorian Whyte, Maxime Bergeron, Anthe George, Kim Tran, Vitalie Stavila, Sivasankari Venkatachalam and Michael Hahn.

Read more: <http://phys.org/news/2014-08-bionic-liquids-lignin-results-pave.html>

“Gas Relief: New Braddock fueling station working to move customers toward biodiesel”

By Ashley Murray, *Pittsburgh City paper*, August 20, 2014

Years into selling local kitchens' used cooking grease as fuel, Fossil Free Fuel, in Braddock, is adding a new component to its slick business model: operating a biodiesel filling station.

Any diesel-powered vehicle — from passenger cars to big rigs — can pull into this unassuming lot at 107 Braddock Ave. and fill up from a 4,000-gallon tank of biodiesel or a 1,000-gallon tank of regular petroleum diesel that can be accessed 24 hours a day with a self-serve card issued by the company.

"We have regular diesel to entice customers who may not be comfortable with using biodiesel right off the bat," co-founder Dave Rosenstrauss says. "Once they can see other similar vehicles running [on biodiesel], it will be a real-life testimonial for them to switch."

Biodiesel is a mix of regular diesel and plant-based oil, like corn, peanut or soybean. The oil goes through a chemical process to make it conducive to existing fuel systems in cars and trucks, meaning that a diesel vehicle needs no modification.

Read more: <http://www.pghcitypaper.com/pittsburgh/gas-relief-new-braddock-fueling-station-working-to-move-customers-toward-biodiesel/Content?oid=1772590>