

EPA Storage Tank Standards Vague, Likely Ineffective

Proposed changes will drive costs up, fail to significantly reduce emissions

BY **FRANK NIETO** | EDITOR, MIDSTREAM MONITOR,
MIDSTREAMBUSINESS.COM

As the Environmental Protection Agency (EPA) continued to impose regulations on the energy industry, it is becoming increasingly obvious that a dichotomy exists between operators and regulators who have little to no experience within the industry they are regulating.

Several regulations proposed by federal regulators during President Obama's first term showed little thought paid to actual costs by producers or midstream operators and zealotry toward actual emission or waste reductions. While the issue of cap-and-trade lost steam in Congress, it was pretty jarring for gas processors to see that initial proposals had processing plants as a point of regulation for greenhouse gas emissions.

To their credit, members of both the administration and Congress were open to hearing the midstream industry's viewpoint on this designation and that designation was removed before legislation died.

However, new proposals from the EPA are showing a similar disconnect in terms of the storage segment of the midstream. Last year, the agency issued proposed uniform emission standards for storage



PROBLEMS AHEAD | The EPA's proposed uniform regulations for storage tanks will fail to meet their goals due to a lack of diversity, according to Sage Environmental Consulting's Beatriz Cardona and Maria Anker.

tanks, which represent a similar cost-benefit disconnect, according to Sage Environmental Consulting's Beatriz Cardona and Maria Anker.

While speaking at the recent National Institute for Storage Tank Management conference in Orlando, Florida, Cardona and Anker stated that the proposed standards are vague in certain respects while also overstating emission reductions and understating costs to operators.

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HIGHLIGHTS FROM TODAY'S EDITION



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NGL PRICES & FRAC SPREAD | Week in Review

Light NGLs Continue To Outperform Heavy Counterparts

BY **FRANK NIETO** | EDITOR, MIDSTREAM MONITOR, MIDSTREAMBUSINESS.COM

Light natural gas liquids (NGL) prices continued to gain strength as the spring approaches with supply-and-demand levels reaching equilibrium thanks to heating demand, increased fractionation and liquefied petroleum gas (LPG) export capacity.

The increase in heating demand caused propane prices to increase 4% at both Mont Belvieu and Conway. The Mont Belvieu price of 93¢ per gallon (/gal) was the highest at the

CURRENT FRAC SPREAD (CENTS/GAL)				
April 01, 2013	Conway	Change from Start of Week	Mont Belvieu	Start of Week
Ethane	25.66		28.84	
Shrink	26.79		26.52	
Margin	-1.13	2.84%	2.32	50.72%
Propane	88.72		92.84	
Shrink	37.01		36.64	
Margin	51.71	3.90%	56.20	4.02%
Normal Butane	131.60		139.74	
Shrink	41.89		41.48	
Margin	89.71	-3.94%	98.26	-1.29%
Iso-Butane	143.18		144.20	
Shrink	40.24		39.84	
Margin	102.94	1.79%	104.36	0.53%
Pentane+	218.50		212.86	
Shrink	44.80		44.36	
Margin	173.70	-1.21%	168.50	-1.10%
NGL \$/Bbl	40.33	1.47%	41.12	1.49%
Shrink	14.76		14.61	
Margin	25.57	-0.14%	26.51	0.76%
Gas (\$/mmBtu)	4.04	4.39%	4.00	2.83%
Gross Bbl Margin (in cents/gal)	57.30	0.04%	60.29	1.00%
NGL Value in \$/mmBtu				
Ethane	1.41	4.73%	1.59	5.53%
Propane	3.08	4.11%	3.22	3.55%
Normal Butane	1.42	-1.44%	1.51	-0.10%
Iso-Butane	0.89	2.51%	0.90	1.16%
Pentane+	2.82	-0.11%	2.74	-0.31%
Total Barrel Value in \$/mmbtu	9.62	1.94%	9.96	1.98%
Margin	5.58	0.24%	5.96	1.43%

NGL PRICES						
Mont Belvieu	Eth	Pro	Norm	Iso	Pen+	NGL Bbl
March 20 - 26, '13	28.84	92.84	139.74	144.20	212.86	\$41.12
March 13 - 19 '13	27.33	89.66	139.88	142.55	213.52	\$40.52
March 6 - 12 '13	26.74	85.78	141.08	146.18	210.26	\$39.91
Feb. 27 - March 5 '13	27.20	85.46	147.98	150.14	215.65	\$40.77
February '13	25.64	86.16	162.10	168.05	234.15	\$43.09
January '13	23.45	83.42	170.21	181.12	223.98	\$42.51
4th Qtr '12	26.59	88.74	162.76	181.71	215.67	\$42.69
3rd Qtr '12	32.34	89.27	142.76	161.88	200.54	\$41.03
2nd Qtr '12	37.00	97.80	160.76	175.08	207.57	\$44.54
1st Qtr '12	53.93	125.90	192.36	204.32	238.95	\$55.05
March 21 - 27, '12	47.68	127.26	192.50	208.14	243.10	\$54.65
Conway, Group 140	Eth	Pro	Norm	Iso	Pen+	NGL Bbl
March 20 - 26, '13	25.66	88.72	131.60	143.18	218.50	\$40.33
March 13 - 19 '13	24.50	85.22	133.52	139.68	218.74	\$39.75
March 6 - 12 '13	24.62	81.58	134.76	142.78	213.48	\$39.12
Feb. 27 - March 5 '13	25.34	81.16	140.78	154.26	219.60	\$40.23
February '13	24.13	81.76	156.45	167.85	230.84	\$42.05
January '13	22.55	78.62	172.77	171.79	221.36	\$41.73
4th Qtr '12	18.45	79.24	164.46	174.39	209.16	\$39.94
3rd Qtr '12	14.60	70.25	124.35	165.61	195.68	\$34.99
2nd Qtr '12	11.18	72.63	135.80	161.38	203.31	\$35.72
1st Qtr '12	26.93	103.34	168.65	184.75	227.16	\$45.92
March 21 - 27, '12	26.34	106.74	172.10	191.70	239.37	\$47.42

(Above) Data Provided by Intercontinental Exchange. Individual product prices in cents per gallon. NGL barrel in \$/42 gallons | Source: Frank Nieto

(Left) Price, Shrink of 42-gal NGL barrel based on following: Ethane, 36.5%; Propane, 31.8%; Normal Butane, 11.2%; Isobutane, 6.2%; Pentane+, 14.3%, Production and transport costs not included.

Conway gas based on NGPL Midcontinent, Mont Belvieu based on Houston Ship Channel.

Shrink is defined as Btus that are removed from natural gas through the gathering and processing operation. Source: Frank Nieto

hub since it was 97¢/gal the week of October 31, while the Conway price of 89¢/gal was the hub's largest since it was the same price the week of April 11, 2012.

Natural gas prices have also spiked at both hubs in recent weeks due to the extended cold front affecting much of the Northeast and Midwest. Prices rose above \$4.00 per million Btu (/MMBtu) at both hubs.

NGL PRICES & FRAC SPREAD | Week in Review

This increase in heating demand has been both a positive and a negative for ethane. It has been positive in the sense that it improved propane prices, which are helping support an increase in ethane prices. The negative is that it is also driving up natural gas prices at a faster rate, which has had a notable pushback on its frac spread margin.

Although ethane had the largest price improvements at both Mont Belvieu and Conway this week, the Conway margin remained negative for the second straight week and the Mont Belvieu margin was only positive in a theoretical sense. The Conway price improved 5% to 26¢/gal, its highest price since the end of January, and the Mont Belvieu price improved 6% to 29¢/gal, the hub's highest price since it was the same price the week of October 31.

The Mont Belvieu margin had the largest increase from the previous week as it increased 51% while the Conway margin rose 3%. However, a 4% improvement in natural gas prices at Conway to \$4.04/MMBtu and a 3% increase at Mont Belvieu to \$4.00/

KEY NORTH AMERICAN HUB PRICES	
2:30 PM CST / March 27, 2013	
Gas Hub Name	Current Price
Carthage, TX	3.96
Katy Hub, TX	4.03
Waha Hub, TX	3.95
Henry Hub, LA	4.10
Perryville, LA	4.01
Houston Ship Channel	4.04
Agua Dulce, TX	3.59
Opal Hub, Wyo.	3.94
Blance Hub, NM	3.81
Cheyenne Hub, Wyo.	3.91
Chicago Hub	4.22
Ellisburg NE Hub	4.08
New York Hub	4.18
AECO, Alberta	3.54

Source: Bloomberg

MMBtu caused margins to remain in a non-attractive state. While light NGL prices are experiencing gains, heavy NGL prices have struggled the last few weeks as refiners switch to summer-grade gasoline and have reduced runs. This has occurred even as crude oil prices improved the week of March 20, when they rose above \$95.00 per barrel (/bbl.).

This increase resulted in heavy NGL prices stabilizing despite the reduced demand. Pentanes-plus (C₅₊) margins fell at both hubs despite prices that largely remained the same from the previous week.

These prices saw the theoretical NGL bbl. price to improve 2% at both hubs, but the Conway margin for this bbl.

RESIN PRICES – MARKET UPDATE – MARCH 27, 2013					
TOTAL OFFERS: 22,780,376 lbs		SPOT		CONTRACT	
Resin	Total lbs	Low	High	Bid	Offer
PP Copolymer - Inj	5,677,000	0.68	0.79	0.72	0.76
LLDPE - Film	2,944,668	0.665	0.775	0.665	0.705
PP Homopolymer - Inj	2,889,012	0.68	0.775	0.7	0.74
LDPE - Film	2,140,920	0.65	0.8	0.735	0.775
HDPE - Blow Mold	834,552	0.67	0.7	0.645	0.685
LDPE - Inj	452,460	0.67	0.73	0.705	0.745
HMWPE - Film	440,920	0.74	0.74	0.675	0.715
GPPS	380,000	0.94	0.94	0.85	0.9
HDPE - Inj	348,552	0.655	0.72	0.645	0.685
HIPS	190,000	1.02	1.02	0.97	1.02
LLDPE - Inj	360,000	0.67	0.72	0.665	0.705

Source: Plastics Exchange – www.theplasticsexchange.com

dropped slightly while the Mont Belvieu margin improved at a slower rate of 1%. The Conway bbl. price rose to \$40.33/bbl. with a margin of \$25.57/bbl., and the Mont Belvieu bbl. price increased to \$41.12/bbl. with a margin of \$26.51/bbl.

The most profitable NGL to make at both hubs remained C₅₊ at \$1.47/gal at Conway and \$1.69/gal at Mont Belvieu. This was followed, in order, by isobutane at \$1.03/gal at Conway and \$1.04/gal at Mont Belvieu; butane at 90¢/gal at Conway and 98¢/gal at Mont Belvieu; propane at 52¢/gal at Conway and 56¢/gal at Mont Belvieu; and ethane at negative 1¢/gal at Conway and 2¢/gal at Mont Belvieu.

The steady heating demand of early 2013 resulted in natural gas storage levels decreasing another 95 billion cubic feet to 1.781 trillion cubic feet (Tcf) from 1.876 Tcf the week of March 22, the most recent data available from the Energy Information Administration. This was a staggering 27% below the storage level of 2.423 Tcf posted last year at the same time and only 4% above the five-year average of 1.720 Tcf. At this rate, we might see the storage level fall below the five-year average for the first time in more than two years in the next week or two.

Natural gas storage levels should continue to fall this week as the National Weather Service's forecast anticipates colder-than-normal temperatures in much of the country. This cold front is expected to run throughout the Midwest and much of the Rockies and Gulf Coast to the East Coast.

PROCESSING TRENDS | An Inside Look

Eagle Ford Generating Billions For Economy

BY MICHELLE THOMPSON | HART ENERGY

The Eagle Ford shale generated more than \$61 billion in revenue for South Texas last year and will continue to sustain the local economy into the foreseeable future, according to a new report.

The area also supported 116,000 full-time jobs last year, according to a study released Tuesday by the University of Texas at San Antonio's Center for Community and Business Research. Jobs include positions in drilling, support operations, pipeline construction, refineries and petrochemicals.

"In 2008, we saw very little activity in the Eagle Ford shale. Today, it has become one of the most significant oil and gas plays in the country and has generated a tremendous amount of wealth for Texas," the center's research director Thomas Tunstall said in a public statement.

"Over the next 10 years, the annual revenue generated and jobs created will continue the steady progress upward, helping to ensure environmental and economic goals can be realized together. The goal is to create sustainable growth for the region."

The study adds that oil and gas development in the Eagle Ford will generate \$89 billion and 127,000 jobs for the region in 2022. Last year alone, the play added more than \$1 billion in local government revenue and about \$1.2 billion in estimated state revenue, the report says.

"This research is a wonderful resource not only for state policymakers and business leaders, but also for all stakeholders who are working to create sustainable communities throughout the shale region," Sen. Judith Jaffirini (Democrat-Laredo) said in a public statement.

"Equally important, it underscores the critical role of the higher education community in public service and economic development."

Researchers at the University of Texas San Antonio compiled the study after examining the Eagle Ford's 14 oil and natural gas producing counties, as well as the six surrounding counties such as Bexar County. The amount of shale-supported jobs in that county is today greater than 20,000, a significant rise from the 5,000 jobs in 2011, the report notes.

Of course, where there are earnings there is also spending. The report cites a Wood Mackenzie Ltd. Statistic indicating oil and gas companies will spend \$28 billion in the play this year. And according to the Center for Community and Business Research, nearly \$19 billion was spent on capital expenditures last year.

ANGA Names President, CEO



NEW LEADERSHIP | Martin Durbin was named chief executive of ANGA, effective May 1.

America's Natural Gas Alliance (ANGA) announced Martin J. Durbin has been named president and chief executive officer, effective May 1. Durbin comes to ANGA after serving as executive vice president at the American Petroleum Institute (API), where he led advocacy efforts on behalf of the oil and gas industry.

As API's executive vice president, Durbin is responsible for integrating the group's government affairs, communications, policy, and legal initiatives. Prior to serving at API, he was vice president of federal relations for the American Chemistry Council (ACC), where he directed federal legislative efforts, lobbying, coalition building, and ACC's political programs. Durbin previously was a legislative assistant for Democratic members in both the U.S. Senate and the U.S. House of Representatives, where he covered environmental and energy-related issues.

Senate Passes Amendment Supporting Keystone XL

On March 22, U.S. Senators John Hoeven (R-N.D.) and Max Baucus (D-Mont.) offered a budget amendment that passed by a vote of 62-37 putting the Senate on record in support of TransCanada Corp's Keystone XL pipeline. The measure, which is symbolic since the project's ultimate decision lays with the State Depart-

PROCESSING TRENDS | An Inside Look

ment, was cosponsored by Sens. John Cornyn (R-Texas), Mary Landrieu (D-La.), Lisa Murkowski (R-Alaska), Heidi Heitkamp (D-N.D.), John Barrasso (R-Wyo.), Mark Begich (R-Alaska), Pat Roberts (R-Kan.) and Joe Manchin (D-W.Va.).

The Hoeven-Baucus measure established a formal recognition by the U.S. Senate that the Keystone XL pipeline will boost the nation's economic growth and contribute revenues to the United States Treasury. Just prior to passage of the Hoeven-Baucus Amendment, a second amendment that attempted to put delays and restrictions on the project was defeated by a vote of 33 to 66.

"Passing this Keystone XL amendment demonstrates with the clarity and firmness of a formal vote that the U.S. Senate supports the construction of the Keystone XL pipeline and finds it in the national interest of the American people," Hoeven said in a press statement. "The amendment recognizes that the country will benefit from the pipeline by adding tens of thousands of jobs for Americans, billions of dollars to our economy and new tax revenue for our local, state and federal governments."

"Budgets are about priorities and right now our number one priority needs to be creating jobs," Baucus said in the release. "Approving the Keystone Pipeline is the perfect opportunity to put Americans to work right now. American workers cannot afford to wait any longer for Keystone jobs, and there is absolutely no excuse for further delay."

The State Department is expected to release its final report on the project shortly and a formal decision on the pipeline will follow after a series of public discussions are held.

NTSB Acknowledges PG&E's Completion Of Safety Suggestions

Pacific Gas and Electric Company (PG&E) announced that the National Transportation Safety Board (NTSB), in a recent letter to the company, acknowledged that PG&E has completed three additional safety recommendations of the 12 that were issued in response to the 2010 pipeline accident in San Bruno. In total, PG&E has completed action on seven of the safety recommendations.

The three recently completed recommendations are:

- **Maximum Allowable Operating Pressure (MAOP) Validation:** PG&E completed MAOP validation for gas transmission pipelines

running through high-consequence, populated areas. In addition, PG&E is on track to complete MAOP validation for the remainder of its transmission pipelines by April 2013.

- **Work clearance procedures:** PG&E's work clearance procedures now include the development of contingency plans for planned work on the natural gas transmission system. These new procedures will ensure accurate and complete clearance forms and will require that specific personnel have complete knowledge of the intended work and clearance procedures. PG&E's work clearance procedures define the planning and controls that must be in place before work is performed on the gas system.
- **Public Awareness Plan:** PG&E developed and incorporated written performance measurements and guidelines into its Public Awareness Plan for evaluating the plan and for continuous improvement. The plan helps ensure communities served are aware of important gas safety information.

The four previously completed recommendations are:

- **Records:** PG&E conducted an intensive records search including retrieving, scanning, and uploading more than 3.5 million paper documents to meet the NTSB's threshold for traceable, verifiable and complete records.
- **Emergency procedure:** PG&E established a comprehensive response procedure to large-scale emergencies on gas transmission pipelines. The procedure identifies a single person to assume command and specifies duties for all others involved; includes development and use of trouble-shooting protocols and checklists; and requires periodic tests or drills to show that the procedure can work.
- **911 notification:** PG&E's gas control room operators, who keep 24-hour watch of the utility's transmission pipeline network, are now required to immediately notify the 911 call centers for the communities affected when a possible pipeline rupture is detected.
- **Toxicological tests:** PG&E has revised its post-accident toxicological testing to ensure timely testing and inclusion of all potentially involved employees.

Of the five remaining safety recommendations, the NTSB considers PG&E's progress "open—acceptable pending completion." The utility will continue making progress toward their completion, which will include revisions and improvements to its integrity management program to ensure the safe operation of its pipeline system.

PROCESSING TRENDS | An Inside Look

Survey Shows Concern About Long-Term Profits

BY **KEEFE BORDEN** | HART ENERGY

Oil and gas executives are generally optimistic about the prospect for growth in the year ahead but are somewhat anxious about the prospect for long-term profits, according to a recent survey of senior executives.

The survey, conducted by the international accounting and consulting firm BDO International Ltd., showed that 48% of the executives think they have better access to capital and credit in the coming year, and 45% said the availability of capital was a top driver of industry growth in 2013.

The survey reflects responses from 84 senior executives at oil and gas companies in the U.S., Russia, United Kingdom, Australia and Canada.

Amid this upbeat attitude, however, executives are moving cautiously, suggesting a degree of anxiety about the long-term profitability of the energy industry. When asked how they plan to improve profitability in the year ahead, 56% of executives say they will focus on internal business processes.

Executives in Australia bucked the trend, with 58% saying they plan to pursue vertical integration through acquisitions. Nevertheless, this inward, efficiency-driven focus reveals a broader concern about becoming too expansive. When asked which region would be a target for expansion, executives overwhelmingly cited their own territory as a preferred target. Very few respondents cited the resource-rich areas of the Middle East, Latin America and East Asia as likely targets for expansion.

“Industry leaders suspect that we may be at the apex of a boom-and-bust cycle,” says Charles Dewhurst, Global Natural Resources Leader, Natural Resources industry group at BDO. “The oil and gas industry is largely beholden to uncertainty, and short-term fluctuations can halt current positive momentum. Environmental and regulatory concerns, commodity price volatility and geopolitical circumstances can all conspire to throw a wrench into companies’ plans.”

One of the most troubling immediate concerns for executives in the year ahead is the possibility of labor shortages. About 51% of executives surveyed expect to increase hiring this year, while 61% anticipate difficulty hiring the skilled workforce needed. As the current workforce ages and engineering schools work to train the next generation of skilled oil and gas laborers, executives worry that

the human capital necessary to take advantage of the current boom may not be readily available.

While the long-term prospects of the oil and gas industry remain in flux, the survey indicates that the North American shale boom is likely driving much of this year’s short-term optimism. When asked which country will lead overall oil production in the future, 39% of executives cite the United States, a 50% lead over those citing Saudi Arabia 26%, the second most frequently cited oil producer in the survey.

Canadian executives are also positive about their own production prospects as a result of their ability to exploit resources from oil sands: 40% of Canadian executives expect their country to lead oil production in the future.

With shale expected to lead production this year, executives also cited the impact of its corresponding technology, primarily hydraulic fracturing, as a major environmental concern. About 44% of executives rank fracking as their top concern this year, and with the exception of Russia executives in every country rate it as their top environmental priority.

Oil and gas executives are also closely watching the regulatory environment. As an industry rife with risk, oil and gas companies are subject to substantial scrutiny. In the wake of a number of recent environmental accidents, including the Deepwater Horizon spill in 2010 and an oil rig grounding off the coast of Alaska in January 2013, oil and gas executives know that their operations are under an international microscope.

About 40% of survey respondents said environmental policy was at the top of their list of regulatory concerns. Though U.K. executives most often cite environmental regulation as their top concern, 27% — three times the study’s average of 9% — also believe that anti-corruption/anti-bribery legislation will pose an issue in the year ahead. The underlying reason appears to be that much of the U.K.’s exploration and production activities occur beyond its borders.

Meanwhile, the U.S. displays a particular sensitivity to corporate tax structure in the wake of ongoing fiscal policy debates, with 35% citing it as a top concern.

The survey also showed oil and gas executives are split on the most preferable way to enter a foreign market. Acquisition in the country of interest and a joint venture with a local company in the country of interest are two most-cited options at 30% each, and independently establishing operations comes in a distant third with 18% of executives citing it as their preferred method.

PIPELINES & TRANSPORTATION | Developments

EIA: Natural Gas Pipeline Additions Lowest Since 1997

BY **FRANK NIETO** | EDITOR, MIDSTREAM MONITOR, MIDSTREAMBUSINESS.COM

The Marcellus shale remains the last bastion of U.S. dry gas midstream investments, as more than half of the natural gas pipelines built in the U.S. were in the Northeast, according to the Energy Information Administration (EIA).

Natural gas pipeline investments fell to their lowest level since 1997, due to a combination of depressed natural gas prices and the success of previous infrastructure build-out that no longer has a pressing need for dry gas transportation capacity.

Indeed, the Northeast is the lone region of the country that still has a sizable natural gas directed rig count along with a lack of pipeline transportation capacity combined with a lack of liquefied natural gas (LNG) shipments to the New York metropolitan and New England areas. According to the EIA, this resulted in 245 miles of new pipeline built in the region.

“Limited capacity additions were concentrated in the northeast United States, mainly focused on removing bottlenecks for fast-growing Marcellus shale gas production,” the EIA reported.

The largest of these projects in the region were Dominion Transmission’s Appalachian Gateway and Equitrans LP’s Sunrise projects, which move volumes from the Marcellus to Northeastern markets.

Dominion Transmission brought the Appalachian Gateway project online in September through the addition of 110 miles of new pipeline along with four new compressor stations to transport 484,260 dekatherms of natural gas from West Virginia and southwest Pennsylvania to an interconnection with the Texas Eastern Transmission pipeline in Westmoreland County, Pennsylvania.

The 41.5 million Sunrise pipeline was brought online in the summer of 2012 and transports 314,000 dekatherms per day of natural gas from Wetzel County, West Virginia, to MarkWest’s Mobley natural gas processing plant in Greene County, Pennsylvania.

Last year represented the smallest amount of added natural gas pipeline mileage in 15 years with the years 2004 and 2005 having the distinction of being the previous lowest years for added capacity with a little more than 1,000 miles added. However, both of these years more than doubled the capacity additions from last year.

Last year also represented the smallest amount of additional transportation capacity in the U.S. since 1999 with both years adding approximately 4.5 billion cubic feet (Bcf). In terms of capital investments, 2012 was the smallest at \$1.8 billion since 2005 when it was a little more than \$1 billion.

Investments in the Northeast were a little more than \$1.5 billion, which was its second-highest level since 1997, trailing the \$2 billion invested in 2008. This year, the EIA anticipates investments in natural gas pipelines to be slightly greater, but with more than double the capacity at 7 Bcf per day. While capacity will come back down to 2012 levels in 2014 and 2015, investments and mileage is expected to remain at the same levels as last year as the Northeast continues its build-out.

Centrica, Cheniere Sign Long-Term LNG Export Agreement

England’s Centrica plc entered into an agreement with Cheniere Energy Partners LP to purchase 91.3 mmbtu (89 billion cubic feet) of annual liquefied natural gas (LNG) volumes for export from the Sabine Pass liquefaction plant in Louisiana. This amounts to approximately 1.75 million metric tons per year, and is the equivalent of the annual gas demand of around 1.8 million U.K. homes. The contract is for an initial 20-year period, with the option for a 10-year extension, and the target date for first commercial delivery is September 2018.

Under the terms of the agreement, Centrica will purchase LNG on a ‘Free on Board’ basis, giving it destination rights for the cargoes, for a purchase price indexed to the Henry Hub natural gas price plus a fixed component. Centrica will export gas from the fifth LNG train at Sabine Pass, on which preliminary engineering work has already begun. The contract is subject to a number of conditions precedents, including Cheniere receiving the necessary regulatory approvals, securing finance, making a final investment decision and issuing a notice to proceed with the fifth LNG train.

PIPELINES & TRANSPORTATION | Developments

Sam Laidlaw, chief executive of Centrica, in a news release said: “In an increasingly global gas market, this landmark agreement represents a significant step forward in our strategy, enabling Centrica to strengthen its position along the gas value chain and helping to ensure the U.K.’s future energy security. We are therefore very pleased to have signed this agreement and look forward to working with Cheniere.”

U.K. Prime Minister, David Cameron, in the same release said “I warmly welcome this commercial agreement between Centrica and Cheniere. Future gas supplies from the U.S. will help diversify our energy mix and provide British consumers with a new long-term, secure and affordable source of fuel.”

U.K. Secretary of State for Energy and Climate Change, Ed Davey, said “Security of U.K. energy supply lies in diversity so I am pleased that Centrica has announced today that it has secured a long-term North American liquefied natural gas export contract with Cheniere Energy Partners. The U.K. already receives gas from a range of countries and we can now add the U.S. to Norway, the Netherlands and Qatar as sources of supply.”

Noble Plans Colorado’s First LNG Plant

Noble Energy Inc. announced plans to construct Colorado’s first liquefied natural gas (LNG) plant.

The \$45 million plant, which will be located in northern Weld County, is expected to produce 100,000 gallons of LNG per day and will have a natural gas processing capacity of 30 million cubic feet per day, the company said.

The Houston-based company said it plans to distribute the LNG to its fleet — drilling rigs and other heavy equipment — in an effort to reduce its carbon footprint.

“This LNG plant is part of Noble Energy’s continuing commitment to reduce emissions and improve the environment where we operate through the use of clean-burning natural gas as an engine fuel, displacing higher-polluting diesel,” Ted Brown, senior vice president, northern region, said in a statement.

“We continuously look for ways to enhance our environmental performance, and this facility is expected to help improve air

quality by enabling us to utilize natural gas we produce right here in Northern Colorado to power many of our local operations.”

The plant, which is being built in conjunction with a natural gas processing plant, is expected to be in service by mid-2014.

Enbridge Invests In Oil Sands Connection

Enbridge Inc entered into an agreement to provide pipeline and terminaling services to the proposed Athabasca Oil Corporation (AOC) Hangingstone Oil Sands Project (the Hangingstone Project). The Hangingstone Project will be the ninth oil sands project to be connected to Enbridge’s regional system.

Enbridge will construct a new 50-kilometer (31-mile), 16-inch diameter pipeline from the Hangingstone Project to Enbridge’s Cheecham Terminal, as well as completing modifications at Cheecham to support the incremental production. The project has an estimated cost of up to approximately \$0.2 billion subject to finalization of scope, which will provide an initial capacity of 16,000 barrels (bbl.) per day with provisions for expansion to accommodate up to a further 60,000 bpd from Phase 2 which is committed to the Enbridge regional system if sanctioned. The Phase I facilities are expected to be in service in the latter half of 2015.

“The attraction of the Hangingstone Project into our regional system confirms the competitive advantages of our existing asset base, reinforcing our expectations of additional growth from this segment of our business,” said Stephen J. Wuori, President, Liquids Pipelines and Major Projects. “We’re pleased to strengthen our relationship with AOC by delivering timely and innovative terminaling and transportation solutions for the development of their oil sands project.”

Under the terms of the agreement, Enbridge will also provide pipeline transportation services to Edmonton on its Regional Oil Sands System for up to 16,000 bbl. per day of diluted bitumen produced from Phase 1 of the Hangingstone Project. The initial term of the pipeline and terminaling agreement is 25 years, with AOC having the right to extend the agreement in successive five-year terms for a total contract life of 45 years.

PIPELINES & TRANSPORTATION | Developments

DNV: Australia LNG Ship Bunkering Would Require Govt. Subsidies

BY JACK PECKHAM | HART ENERGY

A new study on liquefied natural gas (LNG) ship bunkering organized by Norway-based shipping consultant Det Norske Veritas (DNV) for Australia's Joint Industry Project (JIP) finds that LNG-powered shipping in Australia would provide "attractive payback periods" if LNG-fuel prices remain cheaper than marine gasoil or marine diesel oil.

"With proper combinations of bunkering solutions, such as tank trucks, permanent tanks and barges in the different ports, efficient LNG bunkering can be established," according to DNV, summarizing the study.

However, in Australia, "the LNG price is relatively high", versus the price situation in some other countries, according to the study.

That LNG price factor, along with Australia's lack of any shipping "emission-control-area" (ECA) mandate, would discourage aggressive investment in LNG bunkering, according to the study.

"Although LNG-fueled shipping may be financially advantageous, there are uncertainties in Australia linked to the LNG price offered to the ship operator and worries about the second-hand market and asset value development for LNG-fueled ships," according to the study.

"Moreover, in cases where the charterer pays for the fuel, the ship owner may not benefit from the potentially lower operating costs in the case of LNG.

"In order to overcome these ambiguities and jump-start LNG-fueled shipping in Australia, we recommend that all levels of government are encouraged to establish regimes to help interested parties to overcome financial challenges associated with the additional cost aspects during the dawning days of LNG-fueled shipping."

The partners of the JIP included Australian Maritime Safety Authority (AMSA), BOC Limited (Linde Group), Farstad Shipping Pty. Ltd., Ports Australia, Rolls-Royce Marine AS, SVITZER Australia, Swire Pacific Offshore Operations (Pte) Ltd., Teekay Shipping (Australia) Pty. Ltd., Woodside Energy Ltd. and DNV.

According to DNV, the study recommends "more technical guidelines and a clearer regulatory framework to be established, along with financial incentives to kick-start the development" of LNG ship fueling.

"When establishing LNG bunkering, the critical business phase is the first two to four years of operation when the LNG suppliers rely on a few brave ship owners willing to be industry forerunners.

"After some years of successful operation, a second wave of ships is expected to enter the market, which will reduce suppliers' uncertainty and reinforce the business case," according to DNV.

The JIP "focused specifically on the initial phase, and created roadmaps for necessary action for most rapid establishment of LNG bunkering in shortlisted ports. An accelerated approach can open up LNG bunkering in Australia by 2016," according to DNV.

According to the study, "Australia has already a CO2 [carbon dioxide] tax that affect parts of the maritime industry, but the industry in general does not expect that an IMO [International Maritime Organization] imposed [ECA] will be introduced in the near future.

"However, there are arguments for considering LNG as a maritime fuel, such as:

- "Large volumes of natural gas with relatively easy access points are available;
- "Australian shipping industry is currently heavily reliant on imported marine fuel;
- "LNG may reduce the impact on shipping of Australia's CO2 tax;
- "Society increasingly expects that each industry makes environmentally-astute decisions, by substituting heavier fuel oils with LNG then local and global emissions can be significantly reduced;
- "LNG-fueled vessels pose less risk to the environment in case of a marine casualty;
- "Relevant experience in building LNG-fueled vessels is available in Australia; and
- "Australia will, inevitably, be influenced by IMO's global [0.5%-sulfur bunker fuel] sulfur cap coming 2020-2025."

SNAPSHOT | Industry Insight

Natural Gas: The Real Alternative Transportation Fuel

BY JOHN GRAVES | SPECIAL TO HART ENERGY

Wilson Ascencio has been driving a liquefied natural gas (LNG) truck since 2009 for which T. Boone Pickens has been supplying the fuel and the stations. Both men are visionaries, and both run their businesses with an eye on today's profits and tomorrow's values. Are they the vanguard of America's Energy Revolution—or dreamers tilting at windmills?

Independent truckers like Wilson are the pioneers. He drives the Las Vegas —Long Beach corridor. Fueling is available at 250-mile intervals. The cost for fuel is barely one-third that of diesel (\$1.50 vs. \$4.14 as of March 25) and maintenance expense is 25% lower than his previous diesel engine. This has enabled him to recover the price of a new engine (\$35,000) in less than three years. During the average six-year life span of a drayage truck today, he can earn three times what he paid for the LNG engine. Now he is consulting with other drivers who want to learn — and earn — more.

For nationwide drivers, America's "Natural Gas Highway" shares the vision President Eisenhower had 60 years ago: Build it, and they will come. By the end of 2013, Clean Energy Fuels (CLNE) plans to have 150 natural gas fueling stations open across America, anchored by the Flying J Travel Centers. In addition, Love's Travel Stops is adding compressed natural gas (CNG) fueling — and running its tankers on the new Cummins ISX; China's ENN Group has just begun CNG fueling depots in Utah; and ExxonMobil and Shell are considering the local and regional fuel markets.

This buildup will allow truckers who have made the fanciful decision to convert to LNG/CNG to cover many routes currently serviced only with diesel depots.

Fleet operations have been leading the way in the LNG/CNG market. More than 22% of the U.S. public transport fleet is natural-gas powered with UPS, Waste Management and Frito-Lay (PepsiCo) being a few of the corporate examples of today's fuel visionaries. Pacer Cartage and Golden Eagle Distributors are among the mid-sized independents pulling the U.S. fleet of 8 million big rigs back to the future.

CNG has made sense for the base-operation runs common to local municipal vehicle fleets as these vehicles return to the hive each night to refuel and common logistics and maintenance support cost-cutting



SAVINGS | Natural gas is proving to be a hit with truckers and fleet operators due to its lower prices compared to diesel.

\$400,000 for LNG, (stored at 3,600 psi). Tax incentives to station owners of up to \$30,000 contribute to a rapid cost-recovery schedule for any of these fuels. GE is providing funding up to \$200 million for CLNE's mini-liquefied natural gas (LNG) plants at nominal interest rates. Look for the service expansion to explode.

As CNG/LNG choices become viable across the nation, independent truckers and fleet operators alike are looking closely at potentially significant cost savings. Capex for power plants can be earned back in a relatively short 24 to 30 months. Fuel savings are obvious today, but what about next year, next decade? When we begin LNG exports from Cheniere Energy's plant at Sabine Pass in late 2015, what will happen to local pricing of natural gas?

Cummins/Westport and CLNE recently announced long-term refueling contracts coupled to the purchase of new engines. A new Cummins/Westport ISL G or ISX 12G (fueled by CNG, LNG or bio methane) bought with their new Westport LNG tank system will be bundled with a long-term fuel contract through CLNE. The latter engine is a 12 liter, 400 hp and 1,450 torque beast for the serious long-haul trucker.

[READ THE FULL ARTICLE ONLINE](#)

measures. Additionally, smaller tanks don't disrupt shorter runs. New tank technology, lower rollout costs, power plant flexibility, fueling at lower cost and less danger; each of these reasons prompts drivers and fleet operators to consider CNG.

Liquefied petroleum gas (LPG) is another fuel choice for regional drivers. Lower pressure standards for LPG (250-300 psi) storage make an economical choice over LNG. Installation costs for a fueling station are \$50,000 vs.

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“The EPA has indicated that the refining and chemical sectors will be the first two to have these standards, but other sectors may follow. The purpose of these uniform standards is to increase consistency while streamlining and coordinating recordkeeping and reporting requirements,” Cardona said.

On paper this seems like a sound policy, but in reality it will impose a single standard for disparate sectors of the energy industry in the name of simplicity and uniformity while actually increasing the complexity and adding exorbitant costs for operators.

Subpart I of the uniform standard is focused on storage vessels and transfer operations and states that fixed-roof tanks must have self-closing vents to release vapor pressure, even if the tank has low vapor pressure.

Anker cited an American Petroleum Institute (API) study on the cost estimates for these self-closing vent systems and stated that the study anticipates that tank operators will face up to \$275,000 in added costs if the unit must be shutdown and cleaned. The EPA’s cost analysis came in at \$20,000 because it failed to account for potential shutdowns and cleanings.

According to the API report, these additional costs will result in a very small reduction of emissions on an annual basis of just 0.037 tons from storage tanks. “It isn’t very cost-effective at all for the amount of emissions it will decrease,” Anker said.

The uniformity of these standards will also place additional burdens on fixed-roof tank operators by requiring them to monitor the vapor pressure of their volumes. However, Cardona noted that most fixed-roof tanks don’t house high-pressure vapor materials within them, and the regulations allow operators to open their vents whenever needed to relieve pressure.

“Monitoring doesn’t make any sense because operators can open their vents whenever needed and that begs the question of what re-

ally constitutes a leak,” Anker said. At the same time, annual testing on tanks filled with less volatile fluids, such as diesel, are putting unnecessary costs on operators since these pressure levels are unlikely to change on a year-on-year basis.

Despite this, the EPA’s proposed standards will require fixed-roof tanks to utilize either method 21 monitoring, which utilizes a portable instrument to detect volatile organic compound leaks on an annual basis or optical gas imaging on a semi-annual basis, regardless of their tank capacity or vapor pressure.

In addition, if a leak is detected during these inspections, operators have 45 days to repair them. Anker stated that because the capacity for fixed-roof tanks is usually smaller with less volatile volumes, any leaks would be pretty small and the repair could result in a greater amount of emissions due to having to empty and clean the tank.

These requirements also don’t take into consideration that each storage tank is different due to its location and climate or factor in certain safety measures. In some cases, tanks require scaffolding to be erected to undergo repairs while other facilities are located in regions that may require a longer lead time for repairs in months when the temperatures are more moderate and therefore safer for workers in non-emergency situations.

In other ways, some of the regulations make sense, but not on a uniform basis. For example, the requirement that operators check their storage tanks for maximum true vapor pressure (MTVP) makes sense in the case of variable liquids such as waste water since these levels can change. “For this reason, I think that the EPA rules should require these testing standards only for tanks that have variable liquids instead of all types,” Anker said.

[READ THE FULL ARTICLE ONLINE](#)

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