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BP's Tiber discovery, situated approximately 250 miles offshore in the Gulf of Mexico, reached a world record total vertical depth of 35,050 feet. At almost seven miles below the sea surface, Tiber is the deepest well drilled for hydrocarbons in the world. Each of these companies were essential to the success of this record-breaking project.

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Directory Numbers (latest counts)

Directory	Listings	HQ Offices	Personnel	Emails	Phone	Fax	Website
Pipeline	22,584	7,955	67,162	52,951	46,409	21,868	6,328
Refining & Gas Processing	20,873	8,726	58,369	45,344	39,455	20,031	6,462
Petrochemical	18,882	8,264	50,755	38,598	35,863	19,268	5,911
Liquid Terminals	8,457	2,983	28,325	22,693	19,142	8,933	2,637
Gas Utility	13,768	6,645	47,288	37,118	31,035	15,903	4,873
Electric Utility	27,586	13,117	81,906	62,193	49,642	25,432	9,160
Drilling & Well Servicing	15,275	6,745	37,279	28,303	23,639	12,974	3,691
Offshore E&P	9,197	3,842	30,382	25,032	16,240	8,518	3,313
International E&P	10,796	4,647	25,495	16,684	16,869	7,459	2,818
United States & Canada E&P	38,595	23,500	81,713	51,098	54,145	27,242	6,758
Texas E&P	11,760	7,820	31,857	22,614	19,578	9,921	3,101
Houston & Gulf Coast E&P	10,403	6,307	32,722	24,387	18,347	9,409	3,626
Mid Continent & Eastern US E&P	12,370	8,407	29,854	18,954	20,142	8,900	2,576
Rocky MTN & Western US E&P	9,539	6,256	21,603	13,119	13,860	6,710	1,647

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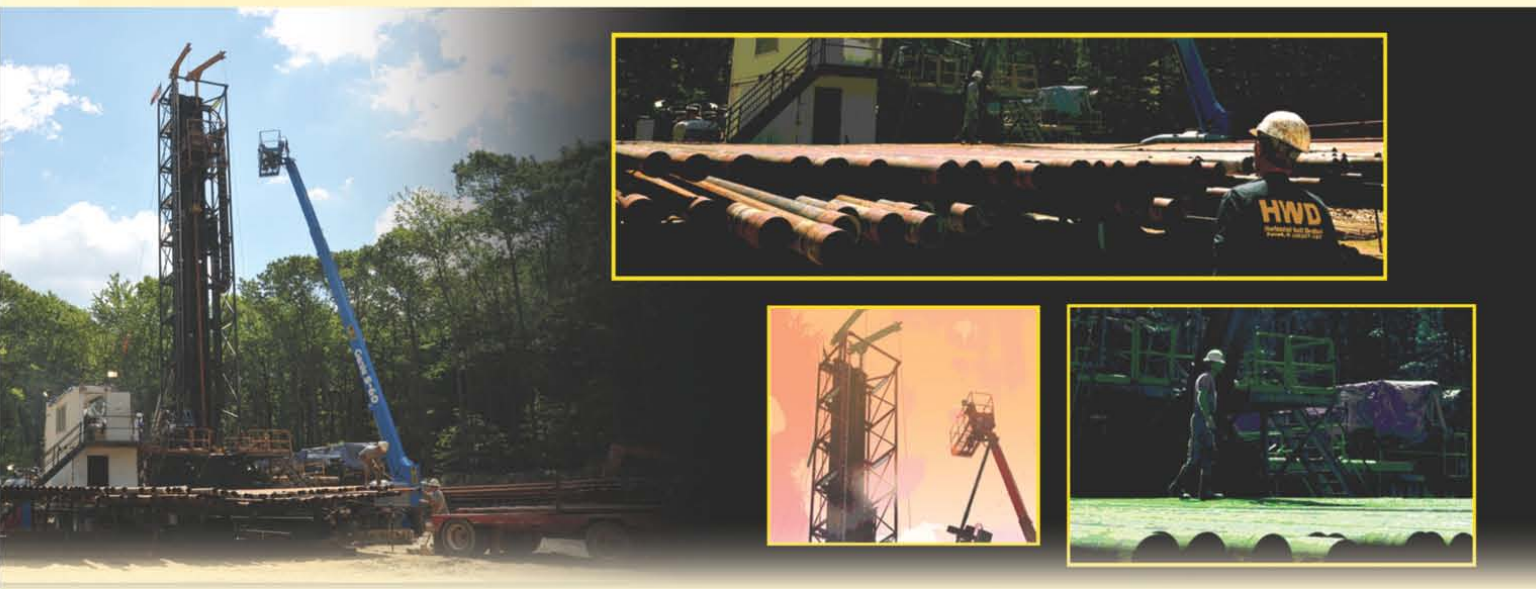
INDEPENDENT OPERATIONS



REGULAR FEATURES

COVER

Federal tax and legislative proposals could pose enough problems to make many US independent producers lose sleep despite dramatically improved natural gas prospects in the Marcellus and other tight shale plays. Many states' officials also are looking for ways to make up lost revenues and seem ready to seek higher oil and gas taxes, while others remain more cautious. OGJ checked in with several of them, as well as state and regional independents' association executives, for its special report on Independent Operations starting on p. 20. Cover photo and above, both depicting a Marcellus gas well, from National Fuel Gas.

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General Interest

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General Interest — Quick Takes

BP identifies midstream assets to divest

BP PLC has identified 22 US properties for divestment in a midstream asset review aimed at bolstering profitability of its refining and associated operations.

According to a company document, the review seeks to reduce operational flexibility of BP's logistics infrastructure and "to create a sustainable, long-term business for the fuel value chains (FVCs) and [450,000-b/cd] Texas City refinery."

FVCs, created in a 2008 refining and marketing reorganization, are regionally integrated refining, logistics, marketing, supply, and trading activities. BP has six of the groups worldwide, two in the US.

According to the document, the asset review aims to "identify the assets that create strategic sources of value as a direct benefit of owning and operating the asset."

Identified for divestment so far are crude and product pipelines, pipeline interests, and terminals on the Gulf and West Coasts and in the Midwest.

The document said BP at present has no plans to shut down properties identified for divestment for which it finds no buyers.

In the past 2 years, the company has been selling company-owned, company-operated service stations in the US.

Profitability is under stress for all US refiners. For the third quarter this year, BP reported a loss from US refining and marketing of $229 million on a replacement-cost basis before interest and tax, compared to a profit of $338 million in third-quarter 2008. In this year's second quarter, the loss was $326 million.

BP reported a third-quarter 2009 profit of $1.145 billion from non-US refining and marketing, compared with $1.634 billion in third-quarter 2008 and $1.006 billion in this year's second quarter.

In the US, BP operates 10,000 miles of liquids pipeline and five refineries with 1.5 million b/d of total capacity.

PDVSA acquires stake in ConocoPhillips project

Venezuela's state-owned Petroleos de Venezuela SA said it has acquired from ConocoPhillips a stake in the Deltana Platform—a joint natural gas project with Chevron Corp.

PDVSA said the acquisition will result in the creation of a new joint venture to exploit the Deltana Platform, with the Venezuelan company having a 61% stake and Chevron 39%. The Deltana Platform is in the Atlantic Ocean between the mouth of the Orinoco River and Trinidad and Tobago.

PDVSA said output will reach 750 MMcfd of gas, which will be transported via a 300-km pipeline to the Gran Mariscal de Ayacucho Industrial Complex, now under construction in Venezuela's Sucre state.

Venezuela produces 6.3 bcfd of gas, but is working on projects to double that output by 2012; currently, the Andean nation has South America's largest proven reserves of gas at more than 170 tcf.

ConocoPhillips and the Venezuelan government are locked in a dispute over compensation for oil operations in the heavy-crude Orinoco belt of eastern Venezuela.

Venezuela's President Hugo Chavez's administration nationalized four heavy oil projects in 2007, seizing control of ConocoPhillips's operations after the companies failed to agree on terms for a minority stake.

ConocoPhillips later initiated international arbitration against Venezuela to secure compensation for its oil investments and operations.

Toreador to exit Turkey, Hungary

Toreador Resources Corp., Paris, has entered into two definitive agreements to sell separately its Turkish subsidiary, Toreador Turkey Ltd., and its Hungarian subsidiary, Toreador Hungary Ltd.

The company's Turkish unit will be purchased by private Norwegian energy company Tiway Oil for a total consideration of $10.6 million paid at closing, plus exploration success payments of up to $40 million plus contingent future net profit payments.

Toreador's Hungarian unit, meanwhile, will be acquired by private Austrian company Rohol-Aufsuchungs AG for $5.8 million plus a contingent payment of $2.9 million to be paid upon post-transaction completion of agreements relating to certain assets of Toreador Hungary.

The Toreador Turkey transaction is expected to close on Oct. 7 and the Toreador Hungary deal has closed on Sept. 30.

Total combined cash proceeds upon closing of both deals will be $16.4 million (which excludes contingent future payments). Both transactions are subject to standard post-closing purchase price adjustments.

Craig McKenzie, Toreador president and chief exploration officer, said, "We expect that the proceeds of these transactions will enable us to continue repurchasing a portion of our convertible notes, and to continue delivering our corporate strategy to develop the low-risk conventional exploration of our French acreage and to plan our 'proof of concept' phase for the unconventional exploitation of the Paris basin oil shale."

KNOC to buy Harvest Energy Trust

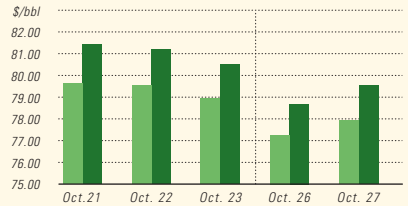
Korea National Oil Corp. plans to buy Harvest Energy Trust for $1.8 billion (Can.) plus the assumption of $2.3 billion in debt.

KNOC Pres. Young-won Kang said the acquisition fits into the company's North American growth strategy.

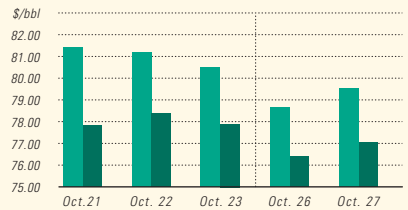
"KNOC has ambitious plans for future growth and is commit-

Industry Scoreboard

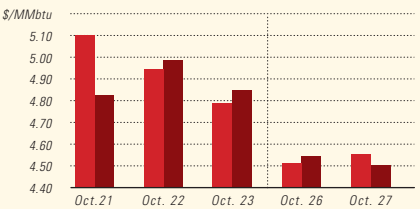
IPE BRENT / NYMEX LIGHT SWEET CRUDE



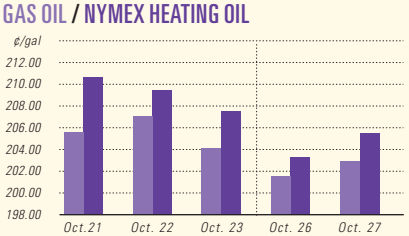
WTI CUSHING / BRENT SPOT



NYMEX NATURAL GAS / SPOT GAS - HENRY HUB



IPE GAS OIL / NYMEX HEATING OIL



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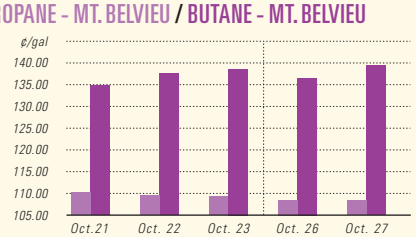
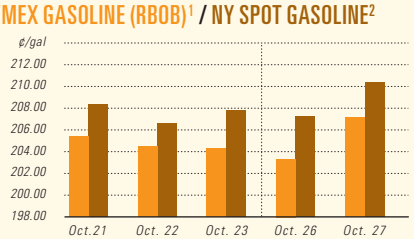


NYMEX GASOLINE (RBOB)[1] / NY SPOT GASOLINE[2]



[1]Reformulated gasoline blendstock for oxygen blending.
[2]Nonoxygenated regular unleaded.

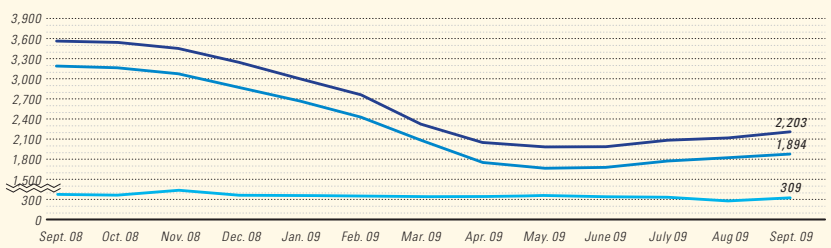
US INDUSTRY SCOREBOARD — 11/2

Latest week 10/16	4 wk. average	4 wk. avg. year ago[1]	Change, %	YTD average[1]	YTD avg. year ago[1]	Change, %
Demand, 1,000 b/d						
Motor gasoline	9,150	8,779	4.2	9,028	9,003	0.3
Distillate	3,495	3,977	–12.1	3,597	3,957	–9.1
Jet fuel	1,399	1,445	–3.2	1,412	1,571	–10.1
Residual	507	561	–9.6	545	620	–12.1
Other products	4,261	4,073	4.6	4,141	4,420	–6.3
TOTAL DEMAND	18,812	18,835	–0.1	18,723	19,571	–4.3
Supply, 1,000 b/d						
Crude production	5,371	4,326	24.2	5,247	4,947	6.1
NGL production[2]	2,035	1,871	8.8	1,997	2,107	–5.2
Crude imports	9,015	9,325	–3.3	9,216	9,764	–5.6
Product imports	2,631	3,116	–15.6	2,773	3,147	–11.9
Other supply[3]	1,599	1,718	–6.9	1,680	1,564	7.4
TOTAL SUPPLY	20,651	20,356	1.4	20,913	21,529	–2.9
Refining, 1,000 b/d						
Crude runs to stills	14,341	13,885	3.3	14,491	14,683	–1.3
Input to crude stills	14,641	14,223	2.9	14,845	15,038	–1.3
% utilization	82.9	80.7	—	84.1	85.4	—

Latest week 10/16	Latest week	Previous week[1]	Change	Same week year ago[1]	Change	Change, %
Stocks, 1,000 bbl						
Crude oil	339,072	337,760	1,312	311,380	27,692	8.9
Motor gasoline	206,945	209,159	–2,214	196,497	10,448	5.3
Distillate	169,888	170,672	–784	124,304	45,584	36.7
Jet fuel–kerosine	45,139	45,336	–197	36,579	8,560	23.4
Residual	34,182	35,071	–889	37,359	–3,177	–8.5
Stock cover (days)[4]			Change, %		Change, %	
Crude	23.6	23.3	1.3	22.6	4.4	
Motor gasoline	22.6	23.0	–1.7	22.2	1.8	
Distillate	48.6	49.5	–1.8	31.5	54.3	
Propane	62.5	70.2	–11.0	67.6	–7.5	
Futures prices[5] **10/23**			Change		Change	%
Light sweet crude ($/bbl)	80.35	75.74	4.61	75.21	5.14	6.8
Natural gas, $/MMbtu	4.97	4.63	0.33	6.70	–1.73	–25.9

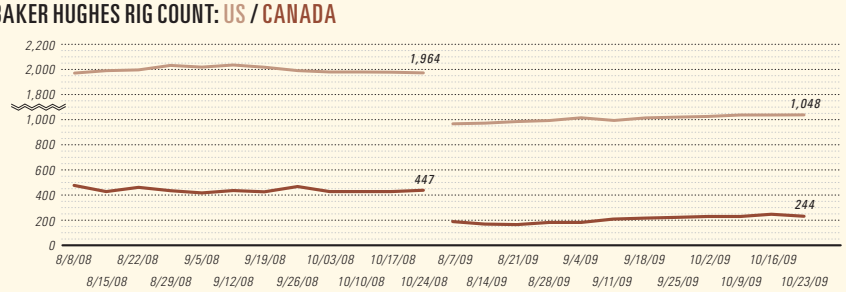
[1]Based on revised figures. [2]Includes adjustments for fuel ethanol and motor gasoline blending components. [3]Includes other hydrocarbons and alcohol, refinery processing gain, and unaccounted for crude oil. [4]Stocks divided by average daily product supplied for the prior 4 weeks. [5]Weekly average of daily closing futures prices.
Sources: Energy Information Administration, Wall Street Journal

BAKER HUGHES INTERNATIONAL RIG COUNT: TOTAL WORLD / TOTAL ONSHORE / TOTAL OFFSHORE



Note: Monthly average count

BAKER HUGHES RIG COUNT: US / CANADA



Note: End of week average count

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ted to a long-term investment strategy in Canada," he said.

Closing is expected before yearend. The transaction remains subject to regulatory approval along with the approval of a 66⅔% of Harvest unitholders.

Harvest reported production of 52,745 boe/d as of Aug. 31, 2009, and reserves of 154.3 million boe as of Dec. 31, 2008. Harvest subsidiary North Atlantic Refining Ltd. owns the 115,000 b/cd Come by Chance refinery in Newfoundland. ✦

Exploration & Development — *Quick Takes*

BP to ply tight sands gas of Jordan's Risha

BP PLC plans to join Jordan's state-owned National Petroleum Co. (NPC) to exploit the onshore Risha concession in northeasternmost Jordan.

Subject to government and parliamentary approval, BP is to farm into the Risha concession as a partner with NPC. The concession borders Syria, Iraq, and Saudi Arabia.

The Risha concession, awarded by the government to NPC, covers about 1.7 million acres. The concession includes Risha gas field, 170 miles northeast of Amman, where the first successful wells were drilled in the late 1980s.

BP said it will conduct initial exploration and appraisal work that will involve shooting seismic, working on existing wells, and drilling new wells. If that is successful, then the company will move to agreeing on a substantive development.

The gas reservoir appears to be tight sandstones of Lower Paleozoic (Ordovician or Silurian) age at 8,000-8,500 ft. Several Risha wells are nearly astride the Jordan-Iraq border.

Husseini et al. wrote in 2007 that Jordan's Paleozoic Risha field produces 30 MMcfd of gas from more than 30 wells. BP said the present rate is more than 20 MMcfd.

It extends across a 10 by 50 km area, "but the reservoir is a thin sheet of complex sandstones in faulted glaciofluvial channels, ranging in thickness from 2 to 12 m. Its proven reserves are 180 bcf of gas, the equivalent of only 32.4 million bbl of oil (OGJ, July 2, 2007, p. 40)."

Indications are that Risha shares similar geology with the undeveloped Akkas discovery about 125 miles east in Iraq's western desert.

Four Chesapeake shales set output marks

Chesapeake Energy Corp., Oklahoma City, achieved record gross operated production from its four main US shale gas plays.

The company reported exceeding 1 bcfd in from the Barnett shale, reaching 500 MMcfd from the Haynesville shale, topping 400 MMcfd from the Fayetteville shale, and attaining 100 MMcfd from the Marcellus shale.

The production levels came from 1,500 Chesapeake-operated Barnett wells, 125 Haynesville wells, 450 Fayetteville wells, and 60 Marcellus wells.

Since entering the Barnett shale in late 2004, the company has become its second largest gas producer.

Chesapeake said the 125 operated Haynesville wells are 20% the number needed to reach the same production level in the Barnett. Plains Exploration & Production Co. is Chesapeake's 20% joint venture partner in the Haynesville.

Chesapeake is also the second largest gas producer in the Fayetteville, where BP America Inc. is its 25% joint venture partner.

Chesapeake said it's the largest leaseholder in the Marcellus, where StatoilHydro is its 32.5% joint venture partner, and expects to become the play's largest producer by the end of 2009.

Among recent completions:

Barnett—The Day Kimball Hill A1 in Tarrant County, Tex., peaked at 16.4 MMcfd and is expected to average more than 13 MMcfd in its first month and exceed the previous monthly industry Barnett output record established by two Chesapeake-operated wells in mid-2009 that averaged more than 9 MMcfd.

Haynesville—Caspiana 13-15-12 H-1 peaked at 20.2 MMcfd, and Bradway 24-15-12 H-1 peaked at 18.6 MMcfd. Both are in Caddo Parish, La.

Fayetteville—Reva Deen 7-8-1-15H9 in White County, Ark, peaked at 8 MMcfd, and Collinsworth 7-16 2-10H in Conway County peaked at 6.2 MMcfd.

Marcellus—Clapper 2H in Susquehanna County, Pa., peaked at 10.1 MMcfd, and Otten 2H in Bradford County peaked at 8.9 MMcfd.

SEG: Group to research low frequency seismic

Five multinational oil and gas exploration and development companies have joined a 3-year project to research low frequency seismic technologies for hydrocarbon reservoir detection and characterization.

Early participants are Cairn Energy PLC, Chevron Corp., ExxonMobil Corp., GDF Suez, and Petroleos Mexicanos. An Asian national oil company is expected to join the group, known as Low Frequency Seismic Partnership, within months, said Spectraseis, Zurich, Switzerland.

The program will cover key application elements of low frequency seismic technology, such as data acquisition and processing, as well as fundamental theoretical studies, in partnership with researchers at Spectraseis, the Swiss Federal Institute of Technology (ETH) in Zurich, and the University of Bern, Switzerland.

Participants will be at the leading edge of the latest research on low frequency seismic applications and will learn how to extract the maximum value from this technology for their companies, Spectraseis said (OGJ, Oct. 26, 2009, p. 33).

Established in 2003, Spectraseis is the principal technology and service provider in the fast-emerging field of low frequency seismic geophysical surveys and data analysis. ✦

Drilling & Production — *Quick Takes*

PTTEP stops trying to plug Montara platform leak

Thai company PTTEP has been forced to abandon its fourth attempt to plug the oil leak from its Montara oil platform in the Timor Sea after the drilling assembly failed while being run in the relief well.

PTTEP is now retrieving the assembly and will continue prepa-

rations to make a new attempt to intercept the leaking well casing later this week.

The company's repeated failures to stop the leak which began in August and has been flowing about 400 b/d into the surrounding sea ever since, has raised the ire of green groups in Australia and around the world.

Concern has been raised for the environment and marine creatures in the region of the spill 750 km west of Darwin.

PTTEP has agreed to fund an environmental monitoring program for at least 2 years, to be carried out by relevant experts and include marine life surveys, wildlife and habitat studies, water-quality testing, and shoreline ecological assessments.

Daniel Boone discovery starts up in US gulf

W&T Offshore Inc., Houston, started oil and natural gas production from the Daniel Boone discovery well in the deepwater Gulf of Mexico.

Sales began Sept. 28 from the well in Green Canyon Block 646 through a 22-mile subsea tieback to a third-party operated platform in Green Canyon 338. Flow rates reached 6,000 b/d of oil and 5.7 MMcfd of gas by late October, W&T Offshore said.

The discovery well is in 4,230 ft of water 120 miles off Louisiana and five blocks east of Tahiti oil field. The company plans to adjust production to achieve maximum recovery from the reservoir.

W&T Offshore is operator with 60% working interest, and Mariner Energy Inc., Houston, has 40%.

Nexus Energy brings Longtom field on stream

Nexus Energy Ltd., Melbourne, has brought on stream its wholly owned Longtom natural gas field in Bass Strait.

The company is now commissioning the production and processing system in coordination with Santos. Gas is being fed by a 19 km subsea pipeline into the Santos-owned former Patricia-Baleen production line to the Santos onshore facilities near Orbost in Gippsland, in eastern Victoria.

Longtom has 2P reserves of 350 petajoules of gas and 4 million bbl of condensate. Santos will buy the gas while Nexus will market the liquids separately. ✦

Processing — *Quick Takes*

Plains All American buys Tulsa storage

Plains All American Pipeline LP has bought receiving pipelines, a manifold system, and 400,000 bbl of crude oil storage capacity at Holly Corp.'s 85,000-b/d refinery in Tulsa for $40 million cash.

Holly, the seller, entered a 15-year tank lease and minimum throughput agreement with Plains covering the six tanks and three crude oil receiving pipelines covered by the transaction. Holly retains ownership of 2.8 million bbl of intermediate and finished product storage at the refinery, which it acquired from Sunoco Inc. last June.

The companies agreed to explore use of the Tulsa storage facilities to capture trading opportunities that may arise from Tulsa's proximity to Cushing, Okla., an important pipeline hub and pricing location.

Holly recently agreed to buy from Sinclair Oil Corp. a 75,000-b/d refinery 2 miles from its Tulsa facility. It plans to integrate the refineries in a move that will lower crude capacity to 125,000 b/d (OGJ Online, Oct. 20, 2009).

Russia, Turkey agree on new Ceyhan refinery

Russia and Turkey, building on earlier discussions, have moved forward with plans to construct a refinery as part of their recent agreement to jointly build the Samsun-Ceyhan pipeline.

"We carried out serious analysis work on the state of the Black Sea oil market," said Russia's Energy Minister Sergei Shmatko, referring to the new pipeline agreement signed by his country, Italy, and Turkey (OGJ Online, Oct. 22, 2009).

"We plan to build a major refinery and sell oil products in the Mediterranean," Shmatko told journalists on the sidelines of a conference. He did not specify the projected capacity or any other details of the refinery project.

However, a broad protocol on oil cooperation, including Russia's participation in construction of the Samsun-Ceyhan oil pipeline, was signed during Prime Minister Vladimir Putin's visit to Ankara in August. Under the protocol, the two sides agreed to set up a working group "aimed at analyzing the possibility of building an oil refinery and organizing the joint sales of petroleum products, including in third countries."

CSB team deploys to Puerto Rico tank explosion

A six-person team from the US Chemical Safety Board (CSB) deployed to investigate an explosion and fire that Caribbean Petroleum Corp. reported at a petroleum storage facility near San Juan, Puerto Rico.

Reports indicated large petroleum storage tanks were on fire Oct. 23 at the gasoline storage and distribution center in Bayamon just west of San Juan. Authorities said 21 of 40 tanks had exploded.

Both the US Federal Bureau of Investigation and the Bureau of Alcohol, Tobacco, Firearms, and Explosives dispatched agents to Bayamon, said an ATF spokesman. Several people were treated for minor injuries, and some 1,500 people were evacuated.

The CSB is an independent federal agency. It investigates all aspects of chemical accidents, including physical causes such as equipment failure as well as inadequacies in regulations, industry standards, and safety management systems.

Algeria receives bids for Tiaret refinery project

Algeria's Sonatrach has received bids from four international companies for the contract to perform front-end engineering and design services for the Tiaret refinery project.

The bidders are Technip, Sinopec, Saipem, and CB&I Lummus.

The 300,000 b/d refinery, which is expected to cost $6 billion to build, is scheduled to start up in 2014, and will produce gas oil,

gasoline, kerosine, butane, propane, and naphtha for both export and domestic consumption.

Vitol to acquire Belgium refining assets

A division of Vitol Group agreed to acquire Petroplus Refining Antwerp and Petroplus Refining Antwerp Bitumen from Petroplus Holdings for $25 million.

The transaction price excludes the cost of the inventory. Closing, subject to regulatory approvals, is expected by yearend.

The Belgium refining assets include a bitumen processing plant with 875,000 tonnes/year capacity. Assets also include a 22,300 b/d gas oil hydrotreater, and tank storage.

Petroplus Holdings, a European independent refiner, currently owns and operates seven refineries having a combined throughput capacity of 864,000 b/d. ✦

Transportation — *Quick Takes*

Enterprise, Duncan to expand Acadian gas line

Enterprise Products Partners LP and Duncan Energy Partners LP announced plans to extend their jointly owned Acadian Gas LLC subsidiary's Louisiana intrastate natural gas pipeline system into northwest Louisiana. The expansion will provide producers in the Haynesville shale access to nine interstate pipelines (Florida Gas, Texas Eastern, Transco, Sonat, Columbia Gulf, Trunkline, ANR, Tennessee Gas, and Texas Gas) via Acadian's existing 1,000-mile south Louisiana network.

The project, dubbed the Haynesville Extension, will have capacity to move 1.4 bcfd through 249 miles of 36-in. and 30-in. OD pipeline connecting to both Acadian's system and its affiliated Cypress Gas Pipeline. Acadian will build two new compressor station totaling 67,000 hp as part of the project. Additional long-term commitments could boost capacity to 2 bcfd. Enterprise expects the Haynesville Extension to enter service in September 2011.

The current Acadian system has access to more than 150 end-use markets between Baton Rouge and New Orleans, a rapid-cycle salt dome storage cavern, and the Henry Hub. The Haynesville Extension will intersect with Acadian in Pointe Coupee and Assumption Parishes and with the Cypress system in Point Coupee and West Baton Rouge. Initial upstream connections will include nine Haynesville shale locations in DeSoto and Red River Parishes.

Regency Energy Partners LP, Alinda Capital Partners LLC, and GE Energy Financial Services announced plans in September to construct a $47 million pipeline extension of the Haynesville Expansion Project (HEP) in North Louisiana to increase capacity on the Regency Intrastate Gas System (RIGS). The extension, called the Red River Lateral, will add 100,000 MMbtu/day of capacity to the current project, bringing the total capacity to about 1.2 bcfd. Regency described the Red River Lateral as the first of several opportunities to extend the HEP (OGJ Online, Sept. 14, 2009).

Energy Transfer Partners LP also in September entered into a 10-year contract with a shipper to transport 300 MMcfd of gas on its Tiger Pipeline system, bringing total capacity commitments on the proposed line to not less than 1.8 bcfd. ETP said the new volume commitment further demonstrated the need for additional pipeline capacity out of the Haynesville shale. Pending necessary regulatory approvals, ETP intends to start construction of the line by June 2010 and have it in service in the first half of 2011.

Julimar gas to go to Wheatstone LNG project

Chevron Australia has made an agreement with Apache Energy Ltd. and Kuwait Foreign Petroleum Exploration Co. (Kufpec) for natural gas from the companies' Julimar and nearby Brunello fields to supply the proposed Wheatstone LNG project in Western Australia.

The arrangement also provides for Apache and Kufpec to take a respective 16.25% and 8.7% interest in the Wheatstone facilities. Chevron will retain a 75% stake in the project.

The deal means Wheatstone is the first LNG project in Australia to attract large volumes of third-party gas supplies. It will also extend the life of Wheatstone as it will unlock 2.1 tcf of gas reserves at Julimar and Brunello and generate a production for 15 years.

Apaches says the likely net capital expenditure for its part of the project will be $1.2 billion for the upstream development of its two fields which lie in permit WA-356-P plus $2.9 billion for its share of the Wheatstone facilities, including the LNG plant.

First phase of Wheatstone development is planned as a two-train LNG facility capable of producing 8.6 million tonnes/year of LNG along with pipeline gas from a domestic gas plant.

Turkmenistan completes gas line spur to China

Turkmenistan has completed construction on its 188-km section of a 7,000-km natural gas pipeline that extends from Turkmenistan to China, according to official media.

"Work on the Turkmen section of the Turkmenistan-Uzbekistan-Kazakhstan-China gas pipeline…is complete," said the state-owned Neutral Turkmenistan newspaper.

Construction of the Turkmen section of the line, at a cost of $400 million, was carried out by Russia's Stroytransgaz. The whole line, which will transport gas from the Caspian Sea across Central Asia to China, is scheduled to start up by yearend. The pipeline starts from Turkmen gas fields near the Amu Darya river. It then enters Uzbekistan at Olot, then flows on to southern Kazakhstan, and on to Alashankou in China, where it will be connected to the West-East Gas Pipeline.

In addition to gas from Turkmenistan and Uzbekistan, the $7.3 billion line is to be supplied from Kazakhstan's Karachaganak, Tengiz and Kashagan gas fields. China National Petroleum Corp. has already signed a 30-year agreement for the supply of 30 billion cu m/year of gas through the new line.

The new development comes at an opportune moment for Turkmenistan, whose gas historically has been piped to Russia. But the Central Asian country has been seeking to diversify its export markets away from Russia. The importance of its strategy was underlined earlier this year after a pipeline explosion sparked a disagreement with Russia's OAO Gazprom that saw Turkmen gas exports almost completely cut off. Since then, the two sides have been unable to agree on a new export arrangement. ✦

Letters

Four "T's" of subsidies

Your editorial "Confusion over subsidies" begs for a more complete discussion or definition of what subsidies are and why they exist (OGJ, Oct. 5, 2009, p. 24). I have been quite concerned about this for many years as I also look at percentage depletion, 14¢ gasoline in some OPEC countries, ethanol tax credits, sugar support, big auto and textile tariffs, etc.

Webster's Dictionary describes "subsidy" as "a grant by a government to a private person or company to assist an enterprise deemed advantageous to the public."

I believe this discussion centers around this definition from the dictionary. It is a directed funding of money raised from all of society to a specific governmental deemed socially important. However, one should also recognize that subsidies have four characteristics. A subsidy should be:

- Targeted. Percentage depletion is a tax deduction targeted at the US oil and gas producer as a means to support capital formation. Government had deemed that domestic production of oil and gas was needed to give society a secure source of energy. (Note: Targets can change just as easily as new governments are elected.)
- Timely. In the case of General Motors, billions of dollars in bailout money was needed to keep a perceived major firm in a major industry alive. The perception by government was that the cash infusion was deemed to be cheaper than the cost to society of the collapse of this firm and its supporting industries. Timing was deemed critical. This source of funding is similar to venture capital as seed money, with the associated equity interest in the firm that could be liquidated at a latter date. (Note: The timing of any change in any target is as swift as a change in government.)
- Transparent. Here I have a real problem in finding a good example of transparency. Perhaps this is because those who create and those who receive most subsidies would rather not expose this monetary transfer to public scrutiny. Why should the source of those

funds have a right to know how they are spent? Isn't that why the US has a representative form of government where "We the People" have assigned that duty to our elected officials knowing that they always act in society's best interest?

• Temporary. This last "T" is the biggest problem with all subsidies. It is politically difficult to stop assisting special interests deemed to help society or, at least, one's reelection coffers. In addition, those who feed at this trough put up such a hew and cry with even the threat of being weaned that the social unrest seen when Iran announced that the controlled 14¢/gal price was about to be doubled, no less moved to global rates, threatened to be truly dangerous.

With this "T" any enterprise deemed to be in the social good still must prove itself. While many actions are best done by government, such as building roads and maintaining a military, the funding of nongovernmental activities should not be allowed an indefinite life span.

Any governmental funding that does not have the characteristic of these four T's is hard to call a subsidy. Rather it is government support of activities that members of society will not support on their own, and if such funding has become engrained in society it evolves into a supposed right that the government is obligated to continue.

So what does this all have to do with the energy industry? Certainly the industry's "subsidies" make it easier to do business. Can it now thrive if any form of subsidy was terminated (along with those subsidies for other forms of energy that are past the start-up phase)? Frankly I hope so. Otherwise why should anyone want to be in this business?

Perhaps looking at subsidies in this manner will put the entire issue into a new light. Of course, the observer still has to be able to see the trees for the forest. And that is an entirely different matter.

John Tobin
The Energy Literacy Project
Evergreen, Colo.

Calendar

✦ Denotes new listing or a change in previously published information.

OIL&GAS JOURNAL online

Additional information on upcoming seminars and conferences is available through OGJ Online, Oil & Gas Journal's Internet-based electronic information source at http://www.ogjonline.com.

2009

NOVEMBER

Deep Offshore Technology International Conference & Exhibition, Monte Carlo, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.deepoffshoretechnology.com. 3-5.

IPAA Annual Meeting, New Orleans, (202) 857-4722, (202) 857-4799 (fax), website: www.ipaa.org. 4-6.

GPA North Texas Annual Meeting, Dallas, (918) 493-3872, (918) 493-3875 (fax), e-mail: pmirkin@gpaglobal.org, website: www.gpaglobal.org. 5.

Capture and Geological Storage of CO_2 Symposium, Paris, +33 1 47 52 67 21, +33 1 47 52 70 96 (fax), e-mail: patricia.fulgoni@ifp.fr, website: www.CO2symposium.com. 5-6.

Sulphur International Conference and Exhibition, Vancouver, +44 20 7903 2058, +44 20 7903 2172 (fax), e-mail: cruevents@crugroup.com, website: www.sulphurconference.com. 8-11.

Gas Turbine Users International (GTUI) Annual Conference, Calgary, Alta., +9714 804 7738, +9714 804 7764 (fax), e-mail: info@gtui.org, website: www.gtui.org. 8-13.

IADC Annual Meeting, Miami, (713) 292-1945, (713) 292-1946 (fax), e-mail: conferences@iadc.org, website: www.iadc.org. 9-10.

Multiphase User Roundtable-South America, Rio de Janeiro, (979) 268-8959, (979) 268-8718 (fax), e-mail: Heather@petroleumetc.com, website: www.mur-sa.org. 9-10.

API Fall Refining and Equipment Standards Meeting, Dallas, (202) 682-8000, (202) 682-8222 (fax), website: www.api.org/events. 9-11.

Digital E&P Event, Houston, (646) 200-7444, (212) 885-2733 (fax), e-mail: cambrosio@wbresearch.com, website: www.digitaleandp.com. 9-11.

NPRA/API Operating Practices Symposium, Dallas, (202) 457-0480, (202) 457-0486 (fax), website: www.npra.org. 10.

Petroleum Association of Wyoming (PAW) Annual Oil & Gas Statewide Reclamation Conference, Casper, (307) 234-5333, (307) 266-2189 (fax), e-mail: cheryl@pawyo.org, website: www.pawyo.org. 10.

Deepwater Operations Conference & Exhibition, Galveston, Tex., (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.deepwateroperations.com. 10-12.

SPE International Oil and Gas China Conference & Exhibition, Beijing, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 10-12.

NPRA International Lubricants & Waxes Meeting, Houston, (202) 457-0480,

Calendar

(202) 457-0486 (fax), website: www.npra.org. 12-13.

ASME International Mechanical Engineering Congress and Exposition (IMECE), Lake Buena Vista, Fla., (973) 882-1170, (973) 882-1717 (fax), e-mail: infocentral@asme.org, website: www.asme.org. 13-19.

Latin America LPG Seminar, Miami, (713) 331-4000, (713) 236-8490 (fax), e-mail: ts@purvingertz.com, website: www.purvingertz.com. 16-19.

IADC Completions Conference, Houston, (713) 292-1945, (713) 292-1946 (fax), e-mail: conferences@iadc.org, website: www.iadc.org. 17.

Houston Energy Financial Forum, Houston, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.accessanalyst.net. 17-19.

IADC Well Control Asia Pacific Conference & Exhibition, Bangkok, (713) 292-1945, (713) 292-1946 (fax), e-mail: conferences@iadc.org, website: www.iadc.org. 18-19.

Energise Your Future Forum, Paris, +33 0 1 47 96 91 68, e-mail: claude.leonard@bostik.com, website: www.energiseyourfuture.com. 18-20..

DECEMBER

Advanced Contract Risk Management Europe for Oil & Gas, Aberdeen, +44 0 207 368 9300, e-mail: enquire@iqpc.co.uk, website: www.contractriskmanagement.MAC=11579.003EDIARY. 1-2.

Refining and Petrochemicals in Russia and the CIS Countries Annual Meeting, Amsterdam, +44 (0) 20 7067 1800, +44 (0) 20 7242 2673 (fax), website: www.theenergyexchange.co.uk. 1-3.

World LNG Summit, Barcelona, +44 (0)20 7978 0000, +44 (0)20 7978 0099 (fax), e-mail: info@thecwcgroup.com, website: www.thecwcgroup.com. 1-4.

European Drilling Engineering Association Expandables, Multilaterals and Technologies Meeting, Vienna, +44 (0) 1483-598000, e-mail: Dukes@otmnet.com, website: www.dea-europe.com. 3-4.

International Petroleum Technology Conference (IPTC), Doha, +971 4 390 3540, e-mail: iptc@iptcnet.org, website: www.iptcnet.org/2009. 7-9.

Nuclear Power International Conference, Las Vegas, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.nuclearpowerinternational.com. 8.

Power-Gen International Conference, Las Vegas, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.power-gen.com. 8-10.

PIRA Natural Gas Markets Conference, New York, (212) 686-6808, (212) 686-6628 (fax), e-mail: sales@pira.com, website: www.pira.com. 14-15.

PIRA Understanding Natural Gas and LNG Markets Seminar, New York, (212) 686-6808, (212) 686-6628 (fax), website: www.pira.com. 14-15.

PIRA Understanding Global Oil Markets Seminar, New York, (212) 686-6808, (212) 686-6628 (fax), website: www.pira.com. 16-17.

2010

JANUARY

Plant Maintenance in the Middle East & Annual Meeting, Abu Dhabi, +44 (0) 1242 529 090, +44 (0) 1242 529 060 (fax), e-mail: wra@theenergyexchange.co.uk, website: www.wraconferences.com. 10-13.

Oil & Gas Maintenance Technology Conference & Exhibition Co-located with Pipeline Rehabilitation and Maintenance, Manama, Bahrain, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.oilandgasmaintenance.com. 18-20.

Pipeline Rehabilitation & Maintenance Co-located with Oil & Gas Maintenance Technology, Manama, Bahrain, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.pipeline-rehab.com. 18-20.

World Future Energy Summit, Abu Dhabi, +971 2 4090 445, +971 2 444 3768 (fax), e-mail: ludoiva.sarram@reedexpo.ae, website: www.worldfutureenergysummit.com. 18-21.

✦Global Floating LNG Summit, London, +44 0 207 368 9300, e-mail: enquire@iqpc.co.uk, website: www.globalflngsummit.com. 20-21.

SPE Oil and Gas India Conference and Exhibition, Mumbai, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 20-22.

SPE Deep Gas Conference, Manama, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 24-27.

API Exploration and Production Winter Standards Meeting, New Orleans, (202) 682-8000, (202) 682-8222, website: www.api.org. 25-29.

Health, Safety, Environment & Training Conference & Exhibition, Houston, (713) 292 1945, (713) 292 1946 (fax), e-mail: info@iadc.org, website: www.iadc.org. 26-27.

The European Gas Conference and Annual Meeting, Vienna, +44 (0) 20 7067 1800, +44 (0) 20 7242 2673 (fax), website: www.theenergyexchange.co.uk. 26-28.

API/AGA Joint Committee on Oil and Gas Pipeline Welding Practices Conference, New Orleans, (202) 682-8000, (202) 682-8222 (fax), website: www.api.org. 27-29.

Annual Gas Arabia Summit, Abu Dhabi, +44 (0) 20 7067 1800, +44 (0) 20 7242 2673 (fax), website: www.theenergyexchange.co.uk. Jan. 31- Feb. 3.

International Process Analytical Technology Forum (IFPAC), Baltimore, (847) 543-6800, (847) 548-1811 (fax), e-mail: info@ifpacnet.org, website: www.ifpac.com. Jan 31-Feb 4.

FEBRUARY

Deep Offshore Technology International Conference & Exhibition, Houston, (713) 963-6271, (713) 963 6296 (fax), e-mail: registration@pennwell.com, website: www.dotinternational.net. 2-4.

IADC/SPE Drilling Conference and Exhibition, New Orleans, (713) 292 1945, (713) 292 1946 (fax), e-mail: info@.org, website: www.iadc.org. 2-4.

Russia Offshore Annual Meeting, Moscow, +44 (0) 20 7067 1800, +44 (0) 20 7242 2673 (fax), website: www.theenergyexchange.co.uk. 2-4.

Global Petrochemicals Conference & Annual Meeting, Vienna, Austria, +44 (0) 1242 529 090. +44 (0) 1242 529 060 (fax), e-mail: wra@theenergyexchange.co.uk, website: www.wraconferences.com. Feb 9-11.

SPE International Symposium & Exhibition of Formation Damage Control, Lafayette, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 10-12.

NAPE Expo, Houston, (817) 847-7701, (817) 847-7703 (fax), e-mail: info@napeexpo.com, website: www.napeonline.com. Feb 11-12.

Annual Petroleum Coke Conference, Seattle, (832) 351-7828, (832) 351-7887 (fax), e-mail: petcoke.conference@jacobs.com, website: www.petcokes.com. 12-13.

SPE North Africa Technical Conference & Exhibition, Cairo, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 14-17.

IP Week, London, +44 0 20 7467 7132, +44 0 20 7255 1472 (fax), e-mail: jbia@energyinst.org.uk, website: www.energyinst.org.uk. 15-18.

Pipeline Pigging & Integrity Management Conference & Exhibition, Houston, (713) 521-5929, (713) 521-9255 (fax), e-mail: clarion@clarion.org, website: www.clarion.org. 16-18.

Pipe Line Contractors Association Annual Conference (PLCA), Scottsdale, Ariz. (214) 969-2700, e-mail: plca@plca.org, website: www.plca.org. 17-21.

Laurance Reid Conditioning Conference, Norman, Okla., (512) 970-5019, (512) 233-2877 (fax), e-mail: bettyk@ou.edu, website: www.lrgcc.org. 21-24.

International Petrochemicals Technology Conference & Exhibition, Madrid, +44 (0) 20 7357 8394, +44 (0) 20 7357 8395 (fax), e-mail: enquiries@europetro.com, website: www.europetro.com. 22-23.

Photovoltaics World Conference & Exhibition, Austin, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.Photovaltaicsworldevent.com. 23-25.

Renewable Energy World North America Conference & Expo, Austin, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.renewableenergyworld-events.com. 23-25.

SPE Unconventional Gas Conference, Pittsburgh, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 23-25.

International Downstream Technology & Catalyst Conference & Exhibition, Madrid, +44 (0) 20 7357 8394, +44 (0) 20 7357 8395

(fax), e-mail: enquiries@europetro.com, website: www.europetro.com. 24-25.

SPE/IADC Managed Pressure Drilling & Underbalanced Operations Conference and Exhibition, Kuala Lumpur, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 24-25.

Nitrogen + Syngas International Conference and Exhibition, Bahrain, +44 20 7903 2058, +44 20 7903 2172 (fax), e-mail: cruevents@crugroup.com, website: www.nitrogenandsyngas2010.com. Feb. 28-Mar. 3.

MARCH

APPEX Conference, London, +44 0 20 74341399, +44 0 20 74341386 (fax) website: www.appexlondon.com. 2-4.

Subsea Tieback Forum & Exhibition, Galveston, Tex., (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.subseatiebackforum.com. 2-4.

Middle East Geosciences Conference and Exhibition, Manama, +973 17 550033, +973 17 553288 (fax), e-mail: fawzi@aeminfo.com.bh, website: www.geobahrain.org. 7-10.

SPE Hydrocarbon Economics and Evaluation Symposium, Dallas, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 8-9.

Annual International LPG Seminar, The Woodlands, Tex., (713) 331-4000, (713) 236-8490 (fax), website: www.purvingertz.com. 8-11.

CERA Week, Houston, (617) 866-5992, e-mail: info@cera.com, website: www.cera.com. 8-12.

NPRA Security Conference & Exhibition, The Woodlands, Tex., (202) 457-0480, (202) 457-0486 (fax), e-mail: info@npra.org, website: www.npradc.org. 9-10.

Annual European Fuels Conference, Paris, +44 (0) 1242 529 090. +44 (0) 1242 529 060 (fax), e-mail: wra@theenergyexchange.co.uk, website: www.wraconferences.com. 9-12.

NACE International Corrosion Conference & Expo, San Antonio, (281) 228-6200, (281) 228-6300 (fax), e-mail: firstservice@nace.org, website: www.nace.org. 14-18.

International Pump Users Symposium, Houston, (979) 845-7417, (979) 845-1835 (fax), e-mail: inquiry@turbo-lab.tamu.edu, website: http://turbolab.tamu.edu. 15-18.

API Spring Committee on Petroleum Measurement Standards Meeting, Dallas, (202) 682-8000, (202) 682-8222 (fax), website: www.api.org. 15-18.

Gas Asia, Kuala Lumpur, +44 (0) 1242 529 090, +44 (0) 1242 529 060 (fax), e-mail: wra@theenergyexchange.co.uk, website: www.theenergyexchange.co.uk. 16-18.

Oil and Gas Africa Exhibition & Conference, Cape Town, SA, +27 21 713 3360, +27 21 713 3366 (fax), e-mail: events@fairconsultants.com, website: www.fairconsultants.com. 16-18.

Offshore Asia Conference & Exhibition, Kuala Lumpur, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.offshoreasiaevent.com. 16-18.

Turkish International Oil & Gas Conference & Showcase (TUROGE), Ankara, Turkey, +44 (0) 207 596 5000, +44 (0) 207 596 5106 (fax), e-mail: oilgas@ite-exhibitions.com, website: www.oilgas-events.com. 16-18.

Electric Light & Power Executive Conference, Tampa, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.elpconference.com. 21-22.

NPRA Annual Meeting, Phoenix, (202) 457-0480, (202) 457-0486 (fax), website: www.npra.org. 21-23.

GPA Annual Convention, Austin, Tex., (918) 493-3872, (918) 493-3875 (fax), e-mail: pmirkin@gpaglobal.org, website: www.GPAglobal.org. 21-24.

AIChE Spring National Meeting & Global Congress on Process Safety, San Antonio, (203) 702-7660, (203) 775-5177 (fax), website: www.aiche.org. 21-25.

Howard Weil Energy Conference, New Orleans, (504) 582-2500, website: www.howardweil.com/energy-conference.aspx. 21-25.

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Middle East Downstream Week & Annual Meeting, Abu Dhabi, +44 (0) 1242 529 090. +44 (0) 1242 529 060 (fax), e-mail: wra@theenergyexchange.co.uk, website: www.wraconferences.com. 22-25.

IADC Drilling HSE Asia Pacific Conference & Exhibition, Singapore, (713) 292 1945, (713) 292 1946 (fax), e-mail: info@iadc.org, website: www.iadc.org. 23-24.

SPE/ICoTA Coiled Tubing & Well Intervention Conference & Exhibition, The Woodlands, Tex., (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 23-24.

Middle East Refining Conference & Annual Meeting, Abu Dhabi, +44 (0) 1242 529 090. +44 (0) 1242 529 060 (fax), e-mail: wra@theenergyexchange.co.uk, website: www.wraconferences.com. 23-24.

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SPE Intelligent Energy Conference and Exhibition, Utrecht, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.intelligentenergyevent.com/conferenceOGJ. 23-25.

Utility Products Conference & Exposition, Tampa, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.utilityproductsexpo.com. 23-25.

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Georgian International Oil, Gas, Energy and Infrastructure Conference & Showcase (GIOGIE), Tbilisi, +44 (0) 207 596 5000, +44 (0) 207 596 5106 (fax), e-mail: oilgas@ite-exhibitions.com, website: www.oilgas-events.com. 24-25.

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Oil & Gas WestAsia Exhibition in conjunction with SPE EOR Conference, Muscat, +968 24660124, +968 24660125 (fax), e-mail: omanexpo@omantel.net.om, website: www.ogwaexpo.com 11-13.

SPE EOR Conference at Oil & Gas West Asia, Muscat, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 11-13.

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International Liquefied Natural Gas Conference and Exhibition, Oran, +44 (0) 20 7596 5000, +44 (0) 20 7596 5111 (fax), website: www.lng16.org. 18-21.

Oil & Gas WestAsia Conference, Muscat, +968 24660124, +968 24660125 (fax), e-mail: omanexpo@omantel.net.om, website: www.ogwaexpo.com. 19-21.

Journally Speaking

Oil-gas price disconnect

Laura Bell
Statistics Editor

Inventories of crude oil and products have been plentiful for the past year, but price volatility has not reflected the more-than-comfortable stock levels. A number of factors have played roles in the price fluctuations, including geopolitics and economic recession.

But the natural gas market has behaved differently. High storage levels of gas have persisted, and drilling for gas in the US fell off the table quickly last year.

The price of oil has rebounded to $80/bbl territory even as crude inventories float above the 5-year range, but gas prices have remained low amid their storage overhang.

Simply put, oil has detached from gas on a btu-value basis.

Oil rig counts rebound

As of Oct. 23, the Baker Hughes rig count of active drilling rigs in the US was 1,048. The weekly rig survey has illustrated a steady rebound from its lowest level of 876 that occurred mid-June. However, it is a 35% drop from the highest level of recent years, which the count hit in January.

At the beginning of this year, the count of US oil rigs stood at its 2009 high at 347, accounting for 21% of the total count of US active drilling rigs. The rigs currently drilling for oil now account for nearly 30% of all active rigs in the US.

A primary driver of the steady slow climb in the US oil rig count is the recent rise in the price of oil. But natural gas prices have remained depressed due to high storage, reducing the need to drill new wells.

Rig counts do follow the trend in prices, though usually with some lag. Fig. 1 shows the movement between the West Texas Intermediate futures prices on the New York Mercantile Exchange and the oil rig count for the period of January 2002 through September 2009.

Gas drilling plummets

For the first time in 11 years, the share of rigs in the US drilling for natural gas dipped below 70% last month, according to the Baker Hughes figures.

The count of gas rigs started to fall in September of last year, as the economic recession took a firm grip and just as Hurricane Ike hit the Gulf of Mexico and Texas. At that time, rigs drilling for gas accounted for about 80% of all US rigs.

Gas prices fell, too. The front-month futures price on the NYMEX plunged to $2.508/MMbtu in early September of this year from a high of $13.577/MMbtu on July 3, 2008.

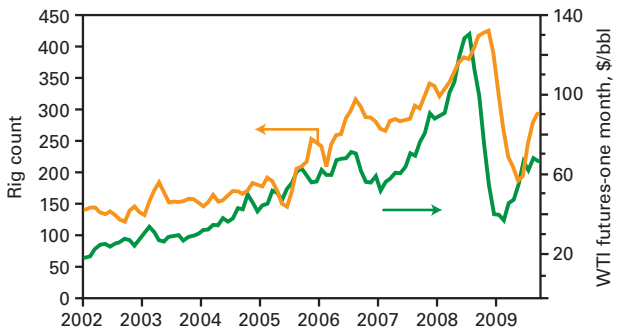
The shrinking share of gas wells and the consequent rise in the share of oil wells in total drilling is a reflection of oil's detachment from gas on a btu-value basis. As the price of oil has rebounded since its precipitous decline a year ago, it has left natural gas prices far behind.

While the price of oil has soared—to past $80/bbl on the NYMEX last month—gas futures have not moved much higher than $5/MMbtu since the start of 2009.

The heat content of crude oil is 5.8 MMbtu/bbl, which means that on a btu-equivalent basis, oil is trading at three times the price of gas.

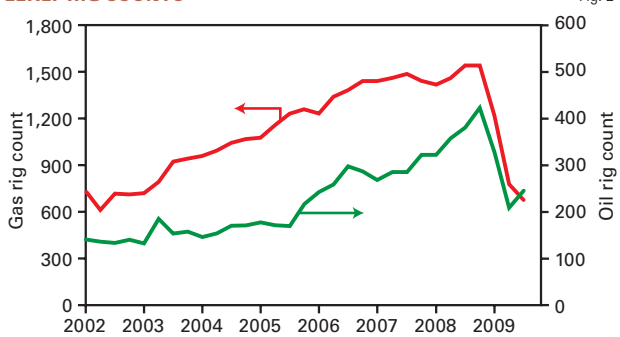
The question for the industry to ask is this: will this disconnect between oil and gas last? ✦

OIL RIG COUNTS AND CRUDE PRICES* Fig. 1



*Data through September 2009.
Source: Baker Hughes, Wall Street Journal

WEEKLY RIG COUNTS* Fig. 2



*Data through September 2009.
Source: Baker Hughes

Editorial

Climate change twists

Twisted legal argument has pushed the US to the verge of a potentially costly litigation spree over climate change. And twisted legal argument might be the only way out of the mess.

The heavy hand of jurisprudence, blind to scientific distinction, is equating greenhouse gases with air pollutants because of their contributions to atmospheric warming. Carbon dioxide, a substance essential to life, thus falls subject to the same regulatory treatment as airborne toxins. This makes no sense. But CO_2 is the villain of global-warming politics because of its correlation with human activity.

Extended confusion

Legal entanglement began with a 2007 Supreme Court decision authorizing the Environmental Protection Agency to regulate greenhouse gases under the Clean Air Act, subject to a finding that the substances threatened human health. EPA, of course, has made that determination and promises to exercise its new authority if Congress doesn't cap emissions by statute.

Courts, meanwhile, are hearing cases that extend the Supreme Court's confusion to specific calamities of the biosphere. Murphy Oil, for example, has been sued for damage to Gulf Coast property during Hurricane Katrina in 2005 on grounds that combustion of its products emitted carbon dioxide, which aggravated global warming, which intensified the hurricane. Similar actions have been filed against other oil companies and coal-burning power producers. Courts have mostly dismissed the cases for lack of merit. Lately, however, appellate courts have ruled for plaintiffs in a couple of cases, including Murphy's. Now the prospect looms for a spate of lawsuits against any wealthy emitter of CO_2 (OGJ Online, Oct. 22, 2009).

This compounding of nonsense cries out for congressional repair. But the Democratic leadership is trying to push into law controversial climate-change responses that would turn energy markets into theaters of governance. It would use the litigation monster as a political lever to win support for its economic siege via cap-and-trade.

The only hope for a reasonable outcome might be a legal flanking movement that probes the core of climate-change fear.

One of many perversions in climate-change politics is the obsession with CO_2. News stories frequently describe the compound as the most important greenhouse gas, which it is not. It's just the greenhouse gas most easily blamed on people, specifically their use of fossil energy.

Far more important as a warming agent than CO_2 is water vapor. In fact, some scientists say further human contributions to CO_2 in the atmosphere can have only minor warming effects. Predictions of catastrophic warming depend on assumptions that CO_2 amplifies net warming attributable to water vapor and clouds. Computer models used by the Intergovernmental Panel on Climate Change assume such amplification and produce, in some cases, alarming forecasts of global average temperature.

Real-world physical interactions, however, seem to differ from those assumptions. Warming from rising CO_2 concentrations might, in fact, produce offsetting changes in clouds and water vapor. Such offsets might help explain an apparent cessation—unpredicted by computer models—of warming since 1998.

"With each passing year, experimental observations further undermine the claim of a large positive feedback from water," testified William Happer, Princeton University professor of physics, at a Feb. 25 hearing the Senate Environment and Public Works Committee. "That is, water vapor and clouds may actually diminish the already small global warming expected from CO_2, not amplify it."

Belief and sacrifice

Because climate feedbacks are poorly understood, they represent an active area of research. Until more is known about them, moderation of CO_2 emissions is prudent. Yet current proposals are anything but moderate. They call for extreme emission cuts and consequent sacrifice in service to the unsubstantiated belief that climate feedbacks are, on balance, ominous. While not everyone shares the belief, everyone would make the sacrifice.

This is tantamount to state-imposed religion. A clever lawyer might make a constitutional case out of it. The argument surely would be a stretch. Some might call it laughable. When tort cases that ask energy suppliers to pay for weather damage advance in the judicial system, however, the potential for laughter no longer can be seen as a restraint. ✦

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Federal, state tax prospects cloud independents' outlook

Nick Snow
Washington Editor

US House members launched their newly formed natural gas caucus on Oct. 21 with a hearing designed to rally support for a domestic fuel they believe could play an increasingly significant role. One witness quickly injected a note of reality into the otherwise optimistic proceedings, however.

Bruce H. Vincent, president of Houston-based independent Swift Energy Co. and vice-chairman of the Independent Petroleum Association of America, warned that proposals being made by Congress and President Barack Obama's administration could harm an industry that is already feeling pressure from lower commodity prices. Bills restricting commodity trading to discourage excessive speculation could keep independents from using hedges that are vital cash-flow management tools, while proposed repeals of incentives that have been in the federal tax code for more than 75 years would slash new drilling and domestic production, Vincent said.

"Natural gas, particularly shale gas, can and will play a pivotal role in America's future energy supply. Independent producers are the key to its development," Vincent said, adding, "If the nation's tax, financial, resource access, and environmental regulatory policies encourage development, gas can live up to its expectations, and our country will be the better for it."

Producers aren't the only ones feeling the impact of severely reduced drilling. States' revenues from oil and gas taxes have dropped along with other business levies.

"If minerals are the cornerstone of the Wyoming revenue forecast, then natural gas is undoubtedly the cornerstone of the minerals forecast," the state's Consensus Revenue Estimating Group said in its Oct. 19 forecast. "By itself, and without counting the contributions made by the condensate portion of the gas stream that is considered to be oil production, natural gas made up greater than 50% of the state's total mineral valuation, and fully 41% of its overall total assessed valuation," it said.

Gas hit hardest

The recession's impacts hit gas valuations hardest of the major minerals, the Wyoming forecast said. Mild summer temperatures exacerbated electrical demand declines brought about by manufacturing slowdowns, resulting in historically high gas storage volumes. With no major supply interruptions

occurring this summer, burgeoning gas supplies filled storage to capacity, reducing gas well drilling in the state by nearly two-thirds from Summer 2008 levels. "The number of rigs operating in Wyoming fell from 90 in May 2008 to 33 in May 2009," the report noted.

Conventional oil and gas drilling in Wyoming is recovering from earlier this year, reflecting higher crude oil prices and stable-to-slightly-increasing gas prices for producers in the state, according to Thomas E. Doll, supervisor of the Wyoming Oil & Gas Commission. "Production from conventional natural gas, particularly in southwestern Wyoming, continues on an increasing trend and has not yet reflected the drop in drilling activity. In fact, built-for-purpose rigs and new drilling technology have increased efficiencies resulting in increased number of wells drilled per rig with drilling times down to 16 or so days per well," he said.

"Production of conventional oil from Wyoming's older fields continues [its] historic decline. However, production of condensate from southwestern Wyoming continues to mask this decline in the older oil fields' production rates. Also, five active carbon dioxide-enhanced oil recovery projects continue their increase in oil production each month," Doll continued.

He said coalbed methane in the Powder River basin has been of greater concern as wells are being shut in not only because of pricing, but because many were producing only water and not effectively depressuring the coal formations to allow gas to flow, were in marginal geologic settings, or had operational problems. Also, the expected significant increase in drilling activity, typically seen each August after the US Bureau of Land Management lifts wildlife stipulations did not occur. "The drilling rig count in the Powder River basin remains one-third of the prior year's activity," Doll said.

"If the nation's tax, financial, resource access, and environmental regulatory policies encourage development, gas can live up to its expectations, and our country will be the better for it." ***—Bruce H. Vincent, president, Swift Energy Co., and vice-chairman, Independent Petroleum Association of America***

Oil and gas production in Michigan also is down, a state official told OGJ. "Our production, particularly of gas, dropped significantly in the past year. Some of it is shut in because of low prices. Oil production seems to be following the usual trend, with a little new production coming on this year," said Harold R. Fitch, chief of the geological survey division within the Department of Environmental Quality.

"Production of conventional natural gas, particularly in southwestern Wyoming, continues on an increasing trend and has not yet reflected the drop in drilling activity.... Production of conventional oil from Wyoming's older fields continues [its] historic decline." ***—Thomas E. Doll, supervisor, Wyoming Oil & Gas Commission***

Basic choice

States face a basic choice when their officials consider how to restore lost oil and gas revenues: They can either raise volumes through incentives for increased activity, or they can simply raise taxes. Responses so far have been mixed.

Arkansas's legislature had increased the state's severance tax at a special session earlier in the year when the economic recession hit in October 2008. "They modernized the old tax structure and based it on price instead of volume. Even though the price went down and the revenue was less, the new system still generates more revenue than the old," said Lawrence E. Bengal, director, Arkansas Oil & Gas Commission. The higher rate became effective on July 1, 2008.

J. Kelly Robbins, executive director of the Arkansas Independent Producers & Royalty Owners Association, said, "This year will show the highest amount ever paid in the state's history, but it won't be because production has grown and the value has increased."

Robbins said, "Collections of severance tax revenue were less than expected because it changed from a volume-based to a value-based tax. With the steep decline in prices, the collection amount fell."

Increased production because of the Fayetteville shale play was one reason, Robbins told OGJ. Another was that Arkansas' severance tax was low compared to other states' taxes. Industry officials worked with Gov. Mike Beebe and his officials to present a proposal to lawmakers, he said. Activ-

ity is down not only in the Fayetteville shale but also in southern Arkansas, where production including stripper wells nevertheless produces $1 million of total revenue daily, and the Arkoma basin.

"Our permitting is down a little bit, but the number of wells being drilled is holding steady. Development is moving ahead and production is steadily increasing statewide. It's certainly not as big as it's been in the past, but it's still moving in a positive direction," Bengal said.

"Our permitting is down a little bit, but the number of wells being drilled is holding steady. Development is moving ahead and production is steadily increasing statewide." ***—Lawrence E. Bengal, director, Arkansas Oil & Gas Commission***

Holding back

Governors in Rocky Mountain states don't seem to be moving quickly to raise oil and gas taxes, according to Kathleen Sgamma, vice-president for government relations at the Independent Petroleum Association of Mountain States in Denver. She said Colorado Gov. Bill Ritter failed to get an initiative passed in 2008 that would have raised taxes, but has since recognized that the downturn in oil and gas activity has reduced the state's budget. "He seems to have come on board and realized the contribution natural gas makes to his state and is trying to promote it more," she said.

Elsewhere, some groups in Utah have made noise about trying to increase that state's severance tax when its legislature meets in 2010, but they're getting no encouragement from lawmakers or Gov. Gary Herbert, Sgamma continued. "[Herbert] realizes that while it looks like Utah has a lower severance tax than other states, raising it would hurt Utah producers more because there's so much federal land there. It's already a very expensive place to operate. Even a small tax increase would drive out production," she said, adding, "Wyoming's governor strongly supports the industry because he realizes how much of his state's budget comes from gas and oil."

Severance taxes have been discussed during 2009 in California and Pennsylvania, however. Pennsylvania Gov. Edward G. Rendell withdrew his proposal for one on gas from the Marcellus shale in early October. Pennsylvania Oil & Gas Association Pres. Stephen W. Rhoads explained, "It was a nonstarter for this year's budget because there were no significant revenues from such a tax with the Marcellus shale play at such an early stage of development. He has made it clear that he plans to revisit this tax option, perhaps as soon as the next budget cycle which begins in about 6 months."

"Pennsylvania has no history of any extraction industry tax. We have a wide range of other taxes which apply to the business, and when you look at other states' tax structures, those with severance taxes also provide offsets for other taxes." ***—Stephen W. Rhoads, president, Pennsylvania Oil & Gas Association***

"Pennsylvania has no history of any extraction industry tax," Rhoads said, adding, "We have a wide range of other taxes which apply to the business, and when you look at other states' tax structures, those with severance taxes also provide offsets for other taxes. They also provide incentives for drilling, such as tax holidays for high-cost wells and to keep marginal wells operating to ensure gas supplies. None of these ideas are considered in the governor's tax proposal. It's a long way from being anything remotely reasonable, from my point of view."

Provisions to encourage more leasing of state forest land were part of the budget adopted by Pennsylvania's legislature, Rhoads told OGJ. It doesn't include any mandate on how much land should be offered or a royalty rate, but does require a specific amount of revenue to come from the oil and gas lease fund. "It's that use of funds that don't exist which will require the Department of Environmental Conservation to go ahead and lease some state forest land. We're looking forward to that. We think that could provide some revenue for the state government which could offset the desire for a severance tax," he said.

'More desperate'

California legislators have considered a severance tax every session for 5-6 years, and it has come before voters as an initiative three times in the last 30 years, most recently 2006 when Proposition 87 was defeated by a 10-point margin,

noted Rock Zierman, chief executive, California Independent Producers Association. "The budget deficit has made some legislators more desperate for new revenue. In California, there is a two-thirds vote threshold for passage of a budget as well as a tax increase," he said.

The state already has an ad valorem tax that assesses oil and gas in the ground, compared to other states which tax the minerals when they reach the surface, Zierman said. "We've analyzed other producing states and we're right in the middle on a per barrel basis. Every state has a different way of collecting taxes on oil, but it comes out pretty similar," he said.

"There are two legislators running against each other for attorney general who plan to introduce severance tax proposals. They're trying to out-hate domestic oil," Zierman continued. "The irony is that they talk about reducing dependence on foreign oil, yet foreign oil would be exempt. Very few of the majors get a significant amount of their revenue from California operations. That's where all of my members produce," he said.

Overall economics there are relatively positive, Zierman indicated. "Any time you have stable prices, it's good. Although lifting costs are higher than historically and most of the new finds are deeper, tighter, and more difficult, stable prices such as we've had the last few months provide incentives to invest dollars in new drilling programs," he said, adding, "Natural gas has been quite a roller coaster, even though prices have largely been decoupled from oil. Activity went down at the end of 2008, but it's started to creep back up. One reason is that drill rig availability is up, where they're readily available now compared to a year ago when a producer had to wait 6 months to a year for one."

Zierman cited two instances which suggest that California could remain one of the nation's leading oil and gas producers for some time. The first was Occidental Petroleum Corp.'s July 22 announcement of an estimated 150-200 million boe in Kern County, which Oxy Chief Executive Officer Ray Irani said was the largest in 35 years within the state. The second was a possible revival of Gov. Arnold Schwarzenegger's proposal to let Plains Exploration & Production Co. directionally drill into state waters from an existing platform in federal waters. On July 24, California's assembly rejected the plan, which the governor and legislative leaders included in a budget rescue package, after the state senate approved it. "It could very well be back, adding $2 billion to the state and $250 million to the adjacent county's revenues," Zierman said.

"The budget deficit has made some legislators more desperate for new revenue.... There are two running against each other for attorney general who plan to introduce severance tax proposals. They're trying to out-hate domestic oil." **—Rock Zierman, chief executive, California Independent Producers Association**

'The real deal'

Pennsylvania's prospects also look bright because of the Marcellus shale's potential. Rhoads said, "We've had several large independent producers for some time. There's a lot of Marcellus interest emerging and getting stronger. Lease prices are going up. This is the real deal," he said, adding, "The larger independents are very interested in this, and the majors are starting to show interest as well. Judging by the interest from all sections of the industry, the bet is that this play has a lot to offer."

Robert W. Watson, an emeritus associate oil and gas engineering professor at Penn State University, testified at the House Natural Gas Caucus's hearing on Oct. 21, stating, "Over the next 5 years, the Marcellus industry will likely transform Pennsylvania into a net exporter of natural gas. In slightly more than 10 years, the Marcellus industry could be generating nearly 175,000 jobs annually and more than $13 billion in value added. Also, over this time frame, the present value of state and local tax revenues earned from Marcellus development is almost $12 billion."

Producers in the state are trying to combat campaigns by some environmental groups to stop development because recovering gas from the Marcellus requires hydraulic fracturing, as it does in other shales. Rhoads said, "There are some very real efforts from some of the environmental community to create the impression that this is a very dangerous activity. We've been fracturing thousands of wells yearly in Pennsylvania since the 1940s. The only difference in the shale wells are the volumes of water used and how the flowback water is handled." Many operators are investigating recycling the water or reinjecting it deep under the surface, which has been used extensively in the US Southwest, he added.

Penn State will hold its second annual natural gas summit, focusing on the Marcellus shale and its potential, on Nov. 16-18. Last year's initial event was so successful that the Interstate Oil & Gas Compact Commission is cohosting this year's. "It's unique. It's decidedly not an industry conference, but one for all stakeholders including county and state officials and some landowners as well as various nongovernment organizations," said Dave Messersmith, a Penn State University extension education

official and the conference's planning committee chairman. He added, "We see it as a forum for all groups to come together and talk about issues arising from development of gas from the Marcellus shale."

He told OGJ, "It was well received last year. After that event, there was no doubt we were going to do a second one. The response this year, so far, has been outstanding." ✦

Incoming Chevron CEO touts 'lead by example' message

Nick Snow
Washington Editor

The US should make more of its resources accessible if it expects other countries to do the same for major US oil companies and independent producers, Chevron Corp.'s incoming chief executive suggested on Oct. 27.

"The best thing America can do is lead by example. We should act the way we want others to act," said John W. Watson, who is scheduled to succeed David J. O'Reilly at the multinational oil company's helm on Dec. 31. "I've already talked about domestic resource access, but the fact is that we also need access to resources around the world. Other nations would be more likely to provide it if we started to do it ourselves."

While politicians have urged US energy independence as a goal since the 1973 Arab oil embargo, one policy after another has severely limited domestic exploration and production, he told the US Chamber of Commerce in a luncheon address.

"In just the past 25 years, America's oil production has fallen by nearly 4 million b/d. This is the equivalent of taking a major producing country's supply off the world market," Watson said. "And over the same 25-year period, US oil demand grew by nearly 4 million b/d. And how have we met all that extra demand? By importing still more from other countries."

Even it reaches the most ambitious targets for fuel-efficient cars and more use of biofuels, the US will still import about 8 million b/d by 2030, he added. "And this assumes no drop-off in the amounts we use domestically, which itself will require new exploration and development at home, to offset natural field declines," he said.

The same Washington mindset that would like to tax oil and gas producers more heavily also refuses to allow a complete and accurate measurement of the nation's oil and gas inventory, Watson said.

'Vast amounts'

"As lawmakers debate whether to use more of our energy resources, wouldn't it make sense to at least determine how much we really have? By rough estimates, America has vast amounts of oil and gas in the Outer Continental Shelf, and an estimated 30 billion bbl of it are currently unavailable for development," he said.

"We know that our methods of extracting it are the safest, most environmentally sound methods in existence. We know that the more we produce at home, the less we import from others. And we know that the result will be new jobs, tax revenue, and a stronger economy when more energy is produced here at home," Watson declared.

While more access to domestic resources would help, the nation can't simply drill its way to energy independence, he said. "The solutions to our energy problems are rarely a case of 'either/or.' It's not a choice between more drilling or more efficiency, coal or wind, nuclear or solar. To achieve energy security, we need it all," he said.

Massive scale, long lead times, and growing demand are the realities the country faces, according to Watson. "And don't doubt for a moment that America has the means and know-how to manage all these challenges," he said. "America is not only the No. 1 producer of ethanol and wind power. We're first in nuclear energy as well. We're the No. 2 producer of coal and natural gas. And we're the world's third-largest oil producer.

"It's clear that we are energy-rich and our capacity is enormous," Watson asserted. "This country is not an energy weakling, or anything close to it. We are an energy powerhouse. We've got what it takes to keep moving forward on all energy fronts. And that is what we must do if we're going to be ready for the increase in demand that will come along when the global economy recovers."

'Far-sighted'

Watson said it will be possible to manage the transition to lower-carbon energy, but it will take a long-term commitment and a grasp of the truce size and scale of the undertaking. "We can make this transition in ways that are smart, sensible, and creative, setting our sights on ambitious and realistic goals," he said. "We need to be far-sighted, and remember that investing in future energy sources is never more important than in a down cycle."

Watson said Chevron sees the way forward on climate change in terms of seven core principals:

- Energy security, "in other words, steady, affordable and reliable supplies to keep this economy functioning and competing."
- Maximized conservation, "because saving a gallon of fuel is like finding a gallon of fuel."
- Measured and flexible approaches, "so we know whether we're meeting our goals, and can make adjustments."
- Broad and equitable treatment, "because no industry or sector should be unduly burdened with taxes, regula-

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"In just the past 25 years, America's oil production has fallen by nearly 4 million b/d. This is the equivalent of taking a major producing country's supply off the world market."— ***John W. Watson, incoming chief executive officer, Chevron Corp.***

tions, and job losses."

- More public and private support for research and development to enable technology advances.
- Transparency, because "simply stated, we need to be candid about the true costs of any policy we adopt in terms of money spent, restrictions imposed, and jobs destroyed."
- Global engagement, "which means that just as every nation stands to gain from reduced emissions, all must work together in realizing that objective."

He continued, "Unfortunately, the cap-and-trade bills we hear so much about don't live up to these principles, especially by the standards of transparency, security, and equitable treatment. Both the House and Senate bills are examples of how goals detached from reality can do more harm than good to our economy and to American workers."

He said the bills—as written—would lay heavy new costs on every US family and business, create new government bureaucracies, lack transparency, and would unfairly impose hidden costs on transportation fuels.

"There are serious and systematic ways of reducing carbon emissions for the long term," said Watson. "But trading in false hopes and inflated numbers will get us nowhere. We need to set goals that are both challenging and realistic. We need to willingly assume the associated costs, which we all must bear. And we need to accept that an economy free of all fossil fuels must just be beyond our reach."

Fossil fuels' role

He said when he visits Washington, he often has a chance to meet with policymakers. "And my best advice to them is never to take economic growth for granted, or to forget that the strongest economies, and those on the rise, are still powered largely by fossil fuels," he said.

"To the extent that oil and gas fuel economic growth, they can actually serve the goal of getting us beyond a carbon-based energy economy," Watson maintained. "It is no coincident that the greatest advances in alternative fuels have come in the past quarter-century, a time of incredible economic expansion. The market is working as investment capital moves in the direction of new sources and greater efficiency."

Advocates of new controls and mandates often neglect this crucial point, he said. "Alternatives depend on innovation, and innovation depends on growth and open economies. Growing economies are always better suited to make the big investments that yield the long-term payoffs," he observed.

Members of the Rainforest Action Network staged a protest outside the US Chamber of Commerce's headquarters, with demands that Chevron assume liability for damage from oil operations to indigenous tribes in Ecuador. Responding to a question following his address, Watson said it involved a project in which Texaco Inc., which Chevron acquired in 2001, was involved until 1990; that Texaco satisfied all of its liabilities before pulling out of Ecuador in 1992, and that Ecuador's government signed off on the settlement before its national oil company assumed full operation of the project.

Allegations that Chevron is dodging responsibility for damages are false, Watson continued. "We see a disturbing trend where US trial lawyers conspire with corrupt officials in producing countries and make outrageous charges. We will fight this vigorously," he said. ✦

Tax policy leaders urged to back high-paying energy jobs

Nick Snow
Washington Editor

A coalition of 15 labor unions and the American Petroleum Institute urged congressional tax policy leaders to support proposals that would protect and encourage the development of high-quality US energy jobs while fortifying national energy and economic security.

Avoiding tax increases on the oil and gas industry is "not only good tax policy, it is good energy policy," members of the Oil & Natural Gas Industry Labor-Management Committee said in Oct. 26 letters to the chairmen and ranking minority members of the US Senate and House's major financial committees.

"As you begin consideration of legislation to address expiring tax provi-

sions and other revenue issues, we urge you to avoid policies that could endanger jobs in the domestic oil and natural gas industry, an industry that is critical to both our energy and economic security," Mark H. Ayers, president of the AFL-CIO's Building and Construction Trades Department, and API Pres. Jack Gerard said in letters they jointly signed on the committee's behalf.

One proposed tax increase, repeal of the federal tax code's Section 199 tax exemption, would jeopardize $32 billion of planned US refinery modifications that would create more than 22,000 construction jobs and 3,000 permanent jobs, they told Senate Finance Committee Chairman Max Baucus (D-Mont.) and Ranking Minority Member Charles E. Grassley (R-Iowa), and House Ways and Means Committee Chairman Charles B. Rangel (D-NY) and Ranking Minority Member Dave Camp (R-Mich.).

The provision was enacted in 2004 as part of the American Jobs Creation Act to give US manufacturers a way to offset foreign government subsidies of the US firms' overseas competitors, Ayers and Gerard noted in their letters. The proposed tax increase would make the exemption inapplicable to the oil and gas industry.

"Between 2005 and 2009, US refining capacity increased by a total of 547,000 b/d. Between 2001 and 2004, [it] increased by a total of 299,000 b/d. In other words, the rate of capacity expansion nearly doubled after the passage of Section 199," the letters said.

They noted that the oil and gas industry supports 9 million jobs in the US, including thousands of building and construction jobs that support refinery modifications and expansions, pipeline construction, and fabrication of equipment used to produce domestic oil and gas.

The committee, which was formed in June, includes representatives of the AFL-CIO's BCTD, which represents 13 national and international unions; the International Union of Operating Engineers; and the United Brotherhood of Carpenters and Joiners of America, as well as several oil and gas companies' chief executives and the API. ✦

Cap-and-trade preferable to EPA regulation, experts say

Nick Snow
Washington Editor

Congress should continue to make a carbon cap-and-trade system its top global climate-change legislative priority because it would be the most efficient and economically attractive approach, three experts agreed on Oct. 20.

The alternative would be to let the US Environmental Protection Agency develop regulations under the Clean Air Act that create a command-and-control regime imposing more costs on industries with significantly fewer economic benefits, the experts said at a Deloitte Center for Energy Solutions forum.

"If carbon dioxide become subject to regulation under the Clean Air Act, every new plant or plant making major modifications has to look at the best available technology for controlling CO_2 before it can get a permit. There also would be significant litigation," said Kenneth Berlin, a partner in Skadden, Arps, Slate, Meagher & Florn LLP's Washington office and head of its environmental and climate change practices.

A cap-and-trade system, on the other hand, would create incentives for companies to develop technologies because it would establish a cost for carbon emissions, according to Martin Gitlin, managing director of US carbon credits at Noble Carbon Credits, a division of Hong Kong commodities merchant Noble Group Ltd.

"Imposing a price on carbon is going to cost money. Right now, greenhouse gases are being emitted for free," Gitlin said, adding, "The idea is to use the market to solve the climate change problem. Regulation by EPA may not be the most effective or economic approach."

Properly structured

Red Cavaney, vice-president for government affairs at ConocoPhillips, said the third-largest major US oil company also believes a cap-and-trade program would be the better way to address global climate change domestically, but only if it's structured properly. It would need to give transportation adequate allowances, be transparent, include federal preemption, and contain a major role for natural gas, he said.

The bill that the US House approved on June 26 meets none of these conditions, Cavaney said, while legislation introduced in the Senate comes closer but still falls short. A key problem is that much of the public and its elected federal lawmakers underestimate the scale and scope of existing energy industries and how long it would take to replace them, he said.

"Oil and gas will play a major role in US energy for several more decades. Trying to retire the industry prematurely would put the United States at a significant economic disadvantage," Cavaney explained.

"There isn't any reason to not go forward with a national climate framework, but it has to be more comprehensive," Cavaney said, adding, "It's going to be a challenge to get consumers to accept the idea of paying a bit more, but they won't accept the entire burden. We need to do this intelligently."

Acid rain program

Gitlin said the US actually invented the use of commodities to address environmental problems when it estab-

WATCHING GOVERNMENT

Nick Snow, Washington Editor

Blog at www.ogjonline.com

Congress forms gas caucuses

Suddenly, members of Congress are talking about natural gas. It was one thing when US Reps. Tim Murphy (R-Pa.) and Dan Boren (D-Okla.) formed a gas caucus on Oct. 1. It was another when Sens. Mary L. Landrieu (D-La.) and Saxby Chambliss (R-Ala.) formed one in the Senate on Oct. 23, 2 days after the House's caucus held its first hearing.

The reasons are obvious, leaders of each caucus said. "When we produce natural gas in America, we produce jobs in America," Landrieu maintained. "A reliable and affordable supply of US energy has profound impacts on every sector of our economy and is the backbone of the US employment base."

Chambliss added, "America has an abundant supply of clean natural gas and has the means to access these resources in an environmentally friendly way. Increasing domestic production is a critical component of a comprehensive energy policy that will reduce America's dependence on foreign sources for our energy needs."

At the House hearing, Murphy observed that new technologies have opened up unconventional gas fields in the Lower 48 in the last 3 years. "With the recent estimates of 1,836 tcf of technically recoverable gas reserves, there is enough domestic supply to power America for more than 100 years," he said.

'Success story'

"The decisions Congress makes in the near term will determine the stability of our domestic energy industry and the future of our nation," added Boren. "It is our job to help our colleagues in Congress understand the great success story there is to be had with natural gas."

But Bruce H. Vincent, president of Swift Energy Co. in Houston and vice-chairman of the Independent Petroleum Association of America, told the House caucus that independents who produce most of the nation's gas already face problems.

"The current drop in gas commodity prices has reduced drilling activity to half of last year's high levels. Credit market restrictions bringing less access to capital are also hampering development," he said.

'Important tool'

Vincent noted that bills in Congress to revise trading of commodities could create problems. "Much of this year's drilling activity is being done because of higher revenues resulting from hedges from earlier years when gas prices were higher," he explained. "The structure of new commodity legislation could inhibit or effectively preclude independents from using this important cash-management tool."

The Obama administration's plan to repeal policies such as intangible drilling and development-cost exemptions, which have been part of the federal tax code since its inception in 1913, and percentage depletion, which was added in 1926, could reduce drilling of new wells 25-40% and cut US production of oil 20% and gas 12%, Vincent added.

With active caucuses on both sides of the Capitol, gas should have plenty of advocates. The question now is whether they'll be able to reach enough other members to make a difference. ✦

lished markets to control sulfur dioxide and nitrous oxide emissions contributing to acid rain in the 1990s. "They're working. You don't hear much about SOx and NOx in the Northeast these days," he said. The program provides both positive and negative lessons in developing a domestic carbon cap-and-trade program, he added.

One such lesson was that it cost much less than expected too deal with SOx and NOx, Berlin noted. "I don't want to sound overconfident, but business has shown that it can develop technologies to meet new challenges," he said.

Europe took the initiative after the administration of former President George W. Bush began and eventually instituted its own carbon cap-and-trade program in 20 countries, Gitlin said. He said that perceptions that Europe's program failed are unfair because measured carbon emissions fell from 2007 to 2008, well before the worldwide recession began last fall.

Although the European Union did not include motor vehicles in the first phase of its cap-and-trade program, gasoline and diesel fuel costs already were high enough that it didn't matter as much, Gitlin said. "In Europe, carbon prices closely follow energy, particularly coal. When it gets cheap relative to gas, carbon prices go up because companies buy more coal," he said. Several US lawmakers are looking closely at price signals and potential volatility, he noted.

The discovery of significant US gas resources in tight shale formations, primarily on private land, could improve the situation by making domestic gas prices much less volatile, Cavaney said. "Power generators have been reluctant to embrace gas more fully because of prices," he said.

Action needed

Participants agreed that action is needed to address global climate change. "Over the next 40 years, we'll have to change how we generate energy and move away from fossil fuels,"

said Berlin. "New technologies may be inherently more expensive. Cars will have to use less energy. The big international debate will be how to fund CO_2 reductions in the developing world going forward. The developed world will have to play a major part."

Cavaney listed three major challenges: Managing the transition, because "it's not clear which companies would be the low-carbon successors at the scale we'll need." Availability of capital, and how it is allocated, because "policy drives where capital goes." And establishing regulatory systems with enough flexibility so that mistakes can be corrected quickly.

In remarks concluding the discussion, the panel's moderator, Rebecca Ramich, director of Deloitte Consulting LLP's federal energy and resources practice, said that the situation is complicated, but that the US and its energy businesses have successfully faced complicated situations before.

"We spawned a new generation of oil and gas exploration and production technologies following the 1973 Arab oil embargo. We came together, admittedly with fits and starts and zigs and zags, to address a major challenge," Ramich said. ✦

SEG: Energy R&D demands funds, collaboration

Alan Petzet
Chief Editor-Exploration

Energy research and development challenges are becoming more complex, demand integrated and individual approaches, and are in need of wider funding sources, concluded a forum at the Society of Exploration Geophysicists annual meeting in Houston.

The scale of the energy system is enormous, and energy technologies average 15 years from the start of research to commercial application, said Donald Paul, executive director, University of Southern California Energy Institute and retired Chevron Corp. chief technology officer.

For example, Paul noted, it takes $200 billion in exploration and production spending to add 1% of global oil and gas reserves. US ethanol output is 1% of global liquids production. And 10 Gw of solar would add 1% to US electricity capacity.

Conventional oil production will be inadequate to meet demand, enormous quantities of new feedstock are available, and low carbon fuel standards are coming, he said.

Hopefully, the world is coming out of the worst economic downturn in our lifetimes, and 2010 liquid fuels demand is forecast to be similar to that in 2006-07, he said. Every form of energy will get bigger, and oil, gas, and coal will dominate.

Making money is the whole basis of industrial technology, Paul said, and energy R&D is capital intensive. The US Department of Energy spent $180 billion on energy research in 1961-2008, and US government spending on clean energy technologies totaled $18 billion in 2006-08.

Energy R&D

DOE has allocated fewer federal dollars to energy R&D funding yearly since 2001, said C. Michael Ming, president, Research Partnership to Secure Energy for America.

But the National Petroleum Council 2007 study said that accelerating technology requires three to five times the funding level of accepting an incremental advancement pace, and to attain a breakthrough demands a 10 to 100 times funding hike, Ming noted.

Federal stimulus funds mostly haven't gone into oil and gas. Private industry's share is much larger than government's in the US, with oil and gas company R&D investment falling and the service company share rising in recent years.

Ming pointed to successful programs in countries such as Norway and Brazil with gross domestic products much smaller than that of the US.

Ming listed several successful US R&D projects. He noted that 24 participants have joined the SEG Advanced Modeling Initiative (SEAM), recommended in 2005 by the SEG Research Committee. Modeled partly after DeepStar, SEAM is focused on generating a realistic synthetic salt model of a 60-block area of the US Gulf of Mexico. SEAM was created in 2007.

Trends apparent

Two major trends are apparent in energy R&D, said Bob Peebler, chief executive officer, ION. They are the need for more rapid diffusion of technology and the need for a more integrated approach.

Peebler said his company conducted mostly internal R&D in 1999. While internal work has continued, the company has now expanded into E&P operator partnerships, corporate venturing with seed capital, academic partnerships, and a joint venture with China National Petroleum Co.'s BGP, the world's largest seismic contractor.

Industry typically does experimental prototypes with such small tests that problems don't surface until full-size tests are performed later, Peebler lamented.

For example, his company wanted to run a geophysical test with 10,000 cableless nodes but could not afford the cost of fielding such an ambitious venture. It has partnered with several oil companies, and however long it takes to learn how to commercially deploy 10,000 to 30,000 cableless nodes over perhaps 80 sq miles, the time will have been cut in half because ION went the partnership route, Peebler said.

John McDonald, Chevron vice-

president and chief technology officer, reminded SEG delegates that the world took 125 years to consume the first trillion barrels of oil and is using the second trillion in 25 years. It is estimated that another trillion barrels remain to be discovered, ostensibly at a cost of $20 trillion over the next two decades.

Sustainable R&D

Research and development has to deliver energy, environment, and economic benefits, especially an economic return if it is to be sustainable, McDonald said. Industry will derive benefits from independent and collaborative research and development.

Areas of applied R&D include how to get biomass to work at commercial scale, how to use lower grade heat in geothermal processes, how to eliminate natural gas use in oil and gas operations, how to make steamflooding work in carbonate reservoirs, and converting heavier products into lighter fuels, McDonald said.

The successful pursuit of carbon sequestration will "sustain a prosperous future for fossil fuels," said Raymond Orbach, director of the energy institute, University of Texas at Austin.

The processes of capturing, compressing, and storing carbon dioxide are highly energy intensive, and the industry needs to reduce the cost of capturing CO_2 from flue gas, which is extremely high, said Orbach, a former DOE official.

Public acceptance of the risks associated with CO_2 storage cannot be taken for granted, as demonstrated by protests in Germany this year against a project to sequester CO_2 at 2,600 ft in a saline aquifer.

Bob Pavey, partner, Morganthaler Ventures and past chairman of the National Venture Capital Association, said energy research projects have become a new destination for venture capital only in the past 2 years or so.

Previously most venture capital went to health care, information technology, and consumer and business services companies.

Great uncertainty revolves around who ultimately will buy the developing energy companies that venture capitalists are supporting with seed funds if those companies' research results in commercially viable technologies, Pavey said. ✦

WoodMac: Carbon bill could be costly to US refiners

Proposed legislation on carbon capture and sequestration potentially could cost US refiners $100 billion/year, threatening the sustainability of the domestic refining industry and giving undue favor to non-US refiners, said analysts at Wood Mackenzie Ltd., Edinburgh, in a recent study.

"The draft US legislation is much more onerous on the US refining sector than its European counterparts," said Alan Gelder, head of downstream oil consulting for WoodMac. "US refiners will not only be required to purchase emission credits for both the stationary emissions (from the refinery) but also the emissions from the subsequent combustion of the fuels."

Moreover, he said, "The free allocation—or cap—for the US refining sector equates to less than 5% of total carbon emissions from the production and consumption of transportation fuels in the US. We expect US refiners will need to purchase around [2 billion] credits in 2015, to the tune of $100 billion/year."

Although the projected costs of credits between the two regions are similar, refiners in northwest Europe are expected to purchase only 3 million credits in 2015, around 0.1% of the US requirement.

In spite of the cost implications for the refining sector, WoodMac anticipates that the impact on product demand will be low compared to other initiatives such as the US vehicle efficiency and Low Carbon Fuel standards. Depending on the interpretation and implementation of the current legislation, the greatest disruption could be to products supply.

"The current legislation's provisions on intrastate trade could offer significant advantages to long-haul gasoline exporters, prompting rationalization of the US refining industry. Even if this intrastate provision is closed, which we anticipate, the costs of carbon will increase overall operating costs, significantly reducing the future cash flows and enterprise value of the US refining industry," Gelder said.

The report, "US Refining—The potentially disruptive impact of carbon," by the independent research consultants includes a comprehensive comparison of the potential impact on US refiners of the proposed Waxman-Markey climate bill, HR 2454, vs. their counterparts in northwest Europe where changes to equivalent legislation, the existing European Emissions Trading Scheme (ETS), will progress into Phase 3 in 2013.

Gelder said, "It is important to note that the proposed Senate climate change and energy legislation has even more stringent emissions targets than the hotly debated Waxman-Markey bill. Although the Senate's goal is to progress the legislation to committees by Thanksgiving, we believe other priorities with healthcare, financial regulatory reform, and the economy will push movement on the bill into next year. That said, the issue will continue to take center stage as the Environmental Protection Agency continues to move forward developing carbon dioxide regulations for mobile sources followed by stationary sources."

Gelder concluded: "The refining

industries on both sides of the Atlantic are in the grip of low utilization rates as a result of the economic downturn and severely reduced demand. While carbon legislation will have a modest impact on European refiners, this legislation is significant to US refiners at a time when many of them are under severe financial pressure." ✦

Lawsuits point to climate change litigation threat

Paula Dittrick
Senior Staff Writer

A climate change litigation threat appears to be looming for the oil and gas industry in the wake of a US Supreme Court decision allowing the regulation of greenhouse gases as air pollutants.

Federal courts recently issued conflicting decisions in climate change litigation. One case involved Murphy Oil USA, and another case involved ExxonMobil Corp. and others. Power companies face the same issues.

The recent litigation all stems from an Apr. 2, 2007, decision in which the Supreme Court ruled that the Environmental Protection Agency has authority under the Clean Air Act to regulate greenhouse gases. That ruling came in a lawsuit filed by Massachusetts and several other states, US cities, and environmental groups.

On Sept. 21, the US Circuit Court of Appeals for the 2nd Circuit in New York City allowed a coalition of eight states, New York City, and environmental groups to sue coal-burning utilities over climate change. The ruling later was cited in the Murphy Oil ruling.

Anthony Cavender of the Pillsbury Winthrop Shaw Pittman LLP law firm in Houston said, "Given that the Obama administration has already advocated for tighter regulations related to the environment as a whole, and in particular for tougher policies governing carbon emissions, many plaintiffs may now feel that the time is right to file such suits."

Murphy Oil suit

On Oct. 16, a three-judge panel of the US Court of Appeals for the 5th Circuit in New Orleans said residents and land owners along the Gulf Coast in Mississippi could seek relief for Hurricane Katrina damages presumed to be related to global warming.

The appeals court ruling in the case of Ned Comer vs. Murphy Oil USA reversed a decision from the US District court for the Southern District of Mississippi, which had dismissed the case.

The appeals court ruled that Comer could assert claims that Murphy Oil operations caused greenhouse gas emissions and contributed to global warming and a rise in sea levels that consequently strengthened Hurricane Katrina.

Comer and others, seeking compensatory and punitive damages, argued they had the legal standing to litigate these claims based on the 2007 Supreme Court decision.

Judge James Dennis in New Orleans wrote that the court arrived at its decision independently but that the "Second Circuit's reasoning [in Connecticut vs. AEP] is fully consistent with ours, particularly in its careful analysis of whether the case requires the court to address any specific issue that is constitutionally committed to another branch of government."

ExxonMobil suit

Separately, the US District Court for the Northern District of California in late September dismissed a climate change lawsuit that Inupiat Eskimos living in Kivalina, Alas., near the Arctic Circle filed against ExxonMobil.

The plaintiffs alleged that 24 oil, energy, and utility companies emitted greenhouse gases that contribute to global warming and consequently diminish sea ice that protects their village from winter storms and erosion.

The California court dismissed the lawsuit for lack of subject matter jurisdiction and because the Inupiat Eskimos could not prove the companies caused any injury. An attorney for the town of Kivalina has said he plans to appeal.

Sheila Harvey, a partner with Pillsbury's climate change and sustainability team in Washington, DC, said that while each case must be individually evaluated on the merits of evidence, she noted that "The decision in Kivalina is more in keeping with how courts have traditionally ruled—often dismissing these types of cases as 'nuisance suits' filed by plaintiffs for no other purpose than to cause headaches for companies they politically or personally disagree with."

Legal implications

John R. Eldridge, an attorney with Haynes and Boone LLP in Houston, notes the lesson for the oil and gas industry is that it cannot expect immediate dismissal of claims associated with damages allegedly caused by GHG emissions.

"This is not saying that a state or tribe or city or individual pursuing one of these claims to abate the nuisance will get an order enjoining an oil company or refinery from emitting carbon dioxide," Eldridge said. "We still don't know how these cases will ultimately turn out."

Meanwhile, he advises oil companies to be prepared in case they get targeted in a tort claim involving climate change.

"Companies need to figure out what their position is about legislation based on the fact that they may be defending these kinds of cases if there is not a fix or a resolution by the US Supreme Court or by Congress," through GHG legislation, Eldridge said.

"I think this is going to be a wake up call for the industry," he said, referring specifically to the Kivalina case. "I think most people had some sense that these claims were so far out that they would be dismissed upfront as political or for lack of standing."

Peter S. Glaser, a partner with Troutman Sanders LLP in Washington, said, "We are having a cataclysm going on in federal and state tort law as it applies to climate change. This is really extraordinary, and I can't overstate to you the importance of this." Speaking during a webcast briefing arranged by the Western Business Roundtable, Glaser said the implication stemming from the recent court decisions is that any GHG emitter, including fossil fuel producers, can be sued.

"The amount of emissions didn't seem to matter…basically any emitter of greenhouse gases and any producer of fossil fuels…can also be sued," Glaser said.

For instance, plaintiffs can sue an oil company and seek an injunction where, if successful, a judge could say stop emitting, use some other type of fuel, or reduce emissions, he said.

"But even worse, you can be sued in damages," Glaser said. "The really worrisome part of the case in Mississippi was that the plaintiffs were property owners in the Hurricane Katrina area represented by old-time, well-known plaintiff trial lawyers. These people don't care about global warming, and they don't care about proper public policy. They want money…. It's even more worrisome because in effect we will have global warming policy now because that is what is really at stake here," if judges and juries can tell oil companies to change their behavior. ✦

Hunt Oil's Peru problems

Environmental concerns are growing around the world, putting increased pressure on the oil and gas industry. Consider Hunt Oil's problems in Peru.

Peruvian tribes want Hunt to abandon its exploration program on Block 76. To emphasize their point, the tribes have threatened to forcibly remove oil workers from a camp near the town of Salvacion in the Madre de Dios region of southern Peru.

After their threat, tribal reps last week said they would hold talks with Hunt officials. "We have to wait for the result of this meeting before we know about the removal," said Maria Gonzalez of the Fenamad indigenous rights group.

The tribes insist that a government concession to Hunt and Repsol to look for oil in Block 76 broke the law. They say the concession strays into the Amarakaeri Communal Reserve, protected ancestral lands that could hold billions of dollars of oil deposits.

Government view

For its part, the government of President Alan Garcia insists that the tribes control only surface rights of the reserve, while the government can freely lease subsoil mineral rights to international oil companies.

In 2006, Hunt signed a License Contract for Block 76, covering 3.5 million acres in the provinces of Manu and Tambopata along the Camisea gas trend.

Hunt, along with Repsol, recently completed the first 2.5-year period of the Block 76 contract, which entailed geology and geophysical studies, an environmental impact assessment, field study and seismic processing. The second period of the partners' contract commenced in the first quarter of 2009.

Hunt also has its supporters in the region. Marco Pastor Rozas of Sernanp, the government agency that oversees protected lands, has said Hunt's plan meets environmental guidelines and that it enjoys the support of at least four of eight communities near the Amarakaeri reserve.

But four of eight does not seem to be quite enough support for Hunt, which – in addition to protests from the Amarakaeri reserve – also faced criticism from two other indigenous associations in the area, Fenamad and Coharyima.

Tribal plans

Together with the Amarakeri, those groups signed a letter this month saying they would "take actions to stop seismic work in the interior of the reserve and even put our lives on the line so that our rights are respected."

According to Fenamad, maps of Hunt's seismic exploration plan include putting explosives or other equipment that causes powerful vibrations all along a big circle that sits within the reserve. They say the process will cause deforestation in a headwaters area of the Amazon basin.

Analyst BMI gives an apt summary of the problem: "Seeking to transform Peru into a net hydrocarbon exporter…[President] Garcia and his predecessor Alejandro Toledo have shown short-sightedness in leasing out large sections of the country to foreign investors without solving the underlying social conflicts."

Unfortunately, it seems that Hunt is paying a hefty price for that short-sightedness. ✦

Satellite data can cost effectively show oil field thermal anomalies

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Exploration field geoscientists have reported the existence of negative thermal anomalies over oil fields and have suggested that thermal profiling can be a useful, cost-effective tool for oil exploration.[1,2]

Though the idea appears to possess much commercial significance, it has still not been well investigated so far, owing to the fact that its field proving is laced with numerous difficulties. These include:

1. Logistical difficulties in collecting concurrent field temperature data over long profiles and extensive areas.
2. Moving field equipment for temperature measurements would involve elapsed time and hence natural diurnal temperature variation, and possible atmospheric-meteorological variations also need to be considered/normalized.
3. Topography, land use land cover, importantly vegetation and local surface moisture, may vary from place to place and also influence local surface temperature to a significant extent—and thus data reduction to a common base to allow lateral comparison becomes a difficult task.

In this context, satellite-borne remote sensing appears to be a powerful viable tool, as temperature data over millions of pixels are collected in a few minutes and solar illumination and atmospheric-meteorological conditions can be considered to be largely uniform for all practical purposes over the scene.

Further, multispectral optical data can be used to deal with the problems of vegetation and surface moisture to a practical reasonable extent.

Cambay basin example

We carried out this study in India's Cambay basin for possible detection of thermal anomalies from satellite sensor data.

Cambay is a marginal intracratonic basin situated in the western margin of the Indian peninsula and comprises a Tertiary sedimentary sand-shale sequence with more than 90 oil and gas fields, being covered by extensive monotonous alluvium.[3,4]

For this study we have used the ASTER satellite sensor data.[5] Data processing includes data conversion, digitization, and computation of reflectance and temperature values using standard procedures[6,7] from ASTER data. The temperature resolution of the space sensor is 0.2° K., and the methodology provides that the processed data output have a correspondence with field measured temperatures within ±1.5° K.

A systematic analysis of ASTER-derived temperature distribution at three known major producing oil fields reveals an interesting pattern.

The temperature estimates in four different spatial windows—the central pixel (each pixel represents a 90 m by 90 m area), and the mean values corresponding to matrices of 3 by 3, 7 by 7, and 11 by 11 pixels—indicate that the temperature at the central pixel is in the range of 299-300° K., and it gradually approaches the scene average of 306.3° K. as the matrix size is enlarged (Table 1).

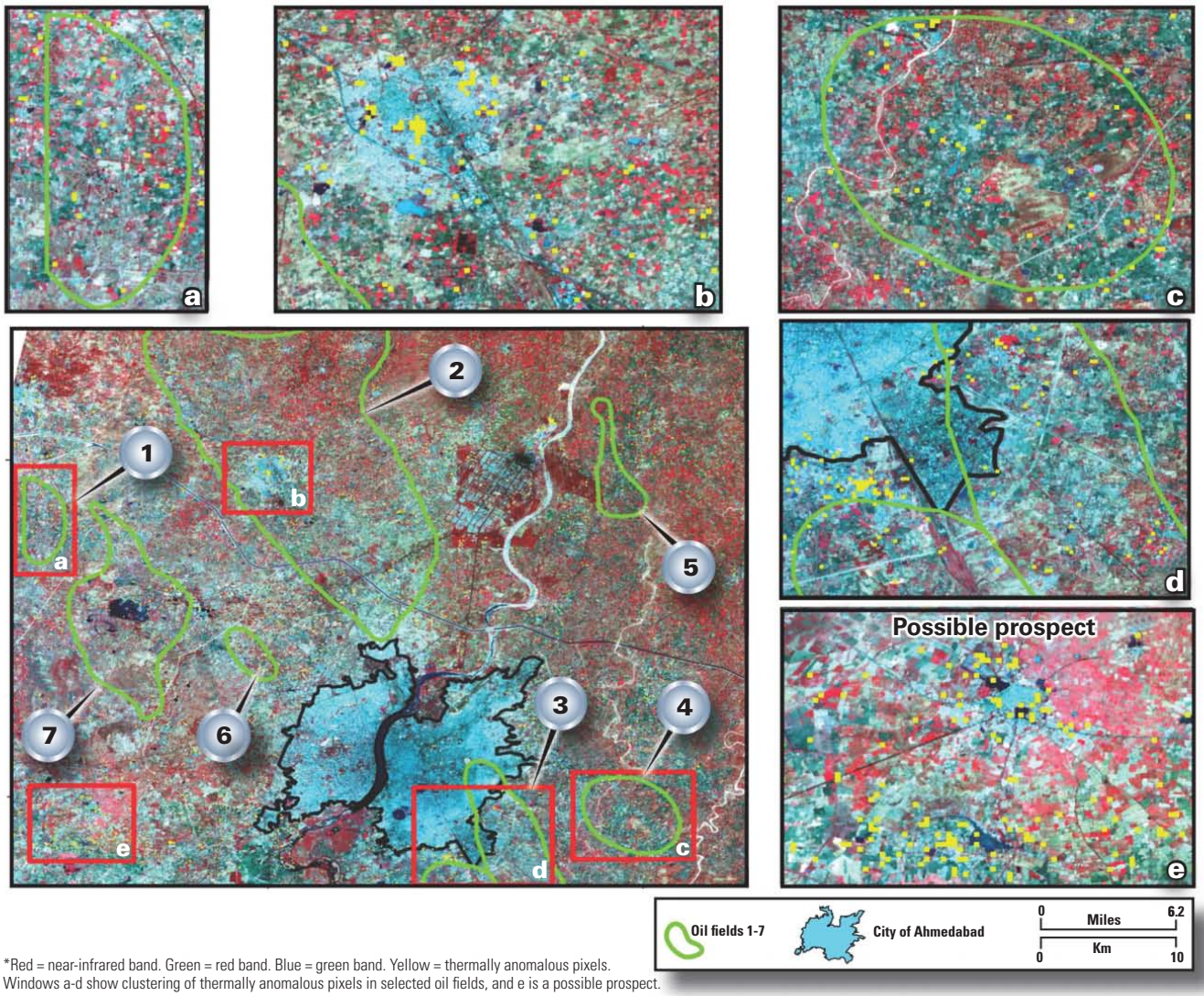
Scene-based dedicated image processing has been carried out to mask and exclude pixels that carry possible effects of artifacts (urban areas, roads, etc.), water bod-

REMOTE SENSING DERIVED SURFACE TEMPERATURES OVER KNOWN OIL FIELDS Table 1

Scene number	Oil field name	Location	Surface temperatures derived in four spatial windows, °K. Temp. of central pixel	Avg. temp. of 3 x 3 matrix	Avg. temp. of 7 x 7 matrix	Temp. of 11 x 11 matrix
1	Sanand	23°03′ N 72°30′ E	299.9	303.8	305.4	306.1
2	Kalol	23°16′ N 72°30′ E	301.3	303.2	304.6	305.2
3	Nawagam	22°55′ N 72°35′ E	300.6	303.7	305.2	305.

ASTER SATELLITE DATA* OVER CAMBAY BASIN OIL FIELDS

Fig. 1



*Red = near-infrared band. Green = red band. Blue = green band. Yellow = thermally anomalous pixels. Windows a-d show clustering of thermally anomalous pixels in selected oil fields, and e is a possible prospect.

ies (lakes, canals, and wet fields) and ground vegetation (forests, agricultural fields, parks, other vegetation, etc.) in the temperature distribution. This has enabled generation of images that show anomalous 'cooler' (temperature range 299-305° K.) pixels, which has been draped over the color infrared (CIR) composite image (Fig. 1).

A synoptic study of distribution of the anomalous pixels shows that many of them lie in clusters at selected locations that also lie within the boundaries of the known oil fields (Fig. 1).

SPATIAL DISTRIBUTION DATA OF 'COOLER' ANOMALOUS PIXELS

Table 2

Scene number	Window	Total number of pixels	Number of anomalous pixels	Percentage of anomalous pixels
1	Whole scene	294222	2653	0.90*
2	OF-1	1547	21	1.36
3	OF-2	26947	269	0.99
4	OF-3	4363	88	1.84
5	OF-4	3168	38	1.20
6	OF-5	1895	18	0.94
7	OF-6	1348	19	1.40
8	OF-7	7501	48	0.64
9	W-a	2849	32	1.12
10	W-b	3081	71	2.30
11	W-c	4810	49	1.10
12	W-d	5893	111	1.48
13	W-e	7465	188	2.51

*Scene average. OF = oil field; W = selected window.

Statistically, the distribution of the above 'cooler' pixels in the entire image is 0.9% (Table 2). However, over individual oil fields, the pixels of thermal anomaly appear in concentrations of 1.0%, 1.2%, 1.4%, and 1.9%. Further, there are regions of stronger aggregation of anomalous (cooler) pixels at certain locations within the areas of oil fields, such that some windows exhibit their clustering up to 1.5%, 2.3%, and 2.5% (Table 2).

It is interpreted that the observed thermal anomaly

pixels are related to the thermophysical characteristics of oil at depth. Oil has characteristically lower thermal conductivity, higher specific heat, and lower thermal diffusivity than the reservoir rock. It is well known that there is a general geothermal energy flux from depth to the earth's surface. The presence of oil in a reservoir would change the effective thermal conductivity, thus causing spatial variations in heat transfer, resulting in relatively lower surface temperatures over oil fields.[1]

Thus, field data already exist on the presence of negative thermal anomalies over oil fields. It is shown here that processed satellite sensor data also exhibit preferential clustering of anomalous cooler pixels over known oil fields.

Based on the above empirical relationship, a possible prospect (e in Fig. 1) can be identified for further investigation. Finally, it may be mentioned that there lies a great potential in satellite sensor data which is yet to be fully investigated and exploited in exploration tasks. ✦

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Chile

Apache Corp. plans to drill three wells on its onshore concessions in southern Chile's Magallanes basin by the end of 2009.

The company expects to spud Esmeralda A-1X on the 3,400-sq-km Rusfin concession within days. It is projected to 13,000 ft or Cretaceous Springhill. The concession surrounds depleted Lago Mercedes oil field (see map, OGJ, Dec. 24, 2007, p. 36).

The rig will then move north to the 1,640-sq-km Lenga concession to drill Carmen A-1X and Carmen B-1X, both to Springhill at 8,200 ft.

Russia

Lundin Petroleum AB, Stockholm, has spud the Petrovskaya-1 exploratory well on the Lagansky block in the northern Caspian Sea off Russia.

The well is on a fourway dip closure on trend, updip, adjacent to the northwest of the company's giant Morskaya oil discovery in less than 2 m of water. The area is just shoreward from Korchagin oil field, which OAO Lukoil is preparing to place on production in early 2010 (see map, OGJ, Aug. 11, 2008, p. 34).

Petrovskaya-1 is to go to 2,100 m and targets Lower Cretaceous sandstones. Gross unrisked prospective resource is estimated at 300 MMboe.

Morskaya field, which Lundin Petroleum discovered in 2008, was the Lagansky block's first significant identified structure with an estimated gross, recoverable resource of 230 MMboe in Aptian and Neocomian (Lower Cretaceous) sandstones.

Lundin Petroleum has a 70% interest in the 2,000-sq-km Lagansky block, the license to which has been extended until 2014.

Texas

West

Arena Resources Inc., Tulsa, finalized a contract with an undisclosed pipeline operator to transport about 95% of oil production from Fuhrman-Mascho field in Andrews County, Tex.

Construction began Oct. 16 on a gathering system that will connect most of the field's existing and new tank batteries, taking an estimated 70% of production by the end of 2009 and 95% ultimately.

The arrangement is expected to save $1/bbl and widen marketing options. Some 5% of output will continue to be trucked. The company's total production averaged 6,000 boe/d in the quarter ended June 30.

Depressant replaces mechanical method for removing blockage

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A viscosity depressant proved effective for replacing the time-consuming mechanical methods for removing heavy oil blockages during the drilling of wells in the Tarim basin of China.

The fracture-cavernous Ordovician carbonate reservoir in Lunxi oil field in the Tarim basin is a multilayered structure with well-developed fractures or fissures in each layer, containing a highly viscous crude oil.

Penetrating these naturally fissured formations often encounters two major downhole problems:

1. Drilling mud loss to the fractured formation leads to a decrease of the fluid column height, thus reducing the pressure exerted on the open formations. This results in the resident fluid in the high-pressure zones to flow into the borehole (well kick or blowout), while the loss zone takes in mud.
2. A well kick or blowout triggered by penetrating a high-pressure formation can in turn cause mud loss to lower pressure formations due to a high shut-in pressure (SIP) or heavy kill mud.

When mud loss occurs, injection of lost circulation material, if not done in time, triggers a well kick that leads to heavy oil flowing into the annulus. This increases the annular pressure and aggravates mud loss.

Mud loss allows more heavy oil into the annulus. When this oil moves up in the annulus, its temperature decreases and its viscosity increases (Figs. 1-3).

Once the heavy-oil temperature decreases to below its congealing point, the solidified crude oil nearly blocks the annulus, causing the drilling mud not to circulate properly and leading to stuck drill pipe.

Analysis shows that in Lunxi oil field, mud loss, well kicks, and stuck drilling tools occurred 14 times in 18 oil wells during 1997-2005, with a drilling time loss of 873 hr.

These problems delayed drilling operation, and the mud loss and heavy oil influx caused serious formation damage.

Drilling wells in this field thus required an effective blockage-removal technique. One solution was to develop an additive that can emulsify crude oil and effectively remove the blockage.

Well history

The drilling of Well LG13 provides an example of the way blockages occur in the field.

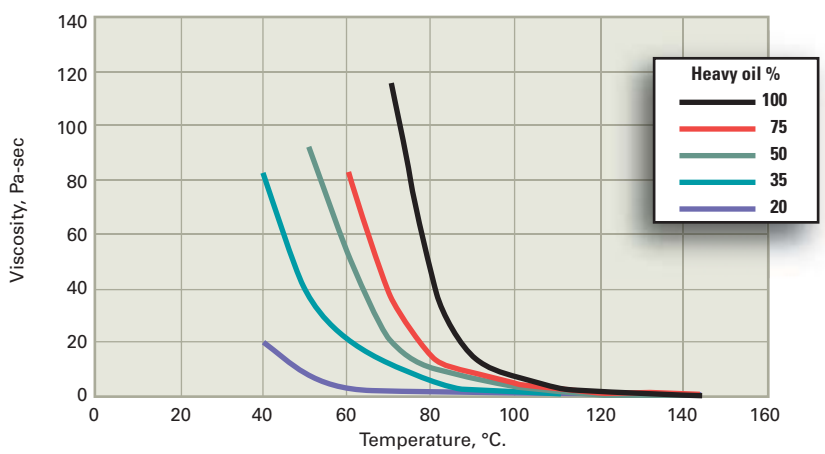
The well at 17:47 on Mar. 5, 2002, encountered lost circulation at a rate of 8.1 cu m/hr. The depth was 5,919.77 m and mud density was 1.08 g/cc.

At 19:25, the drilling bit reached 5,923.34 m, and the rate of mud loss rose to 33.0 cu/hr. At 19:57, the drilling operation stopped, and the well kicked at a rate of 16.9 cu m/hr.

The drilling operation continued

DRILLING MUD, HEAVY OIL VISCOSITY

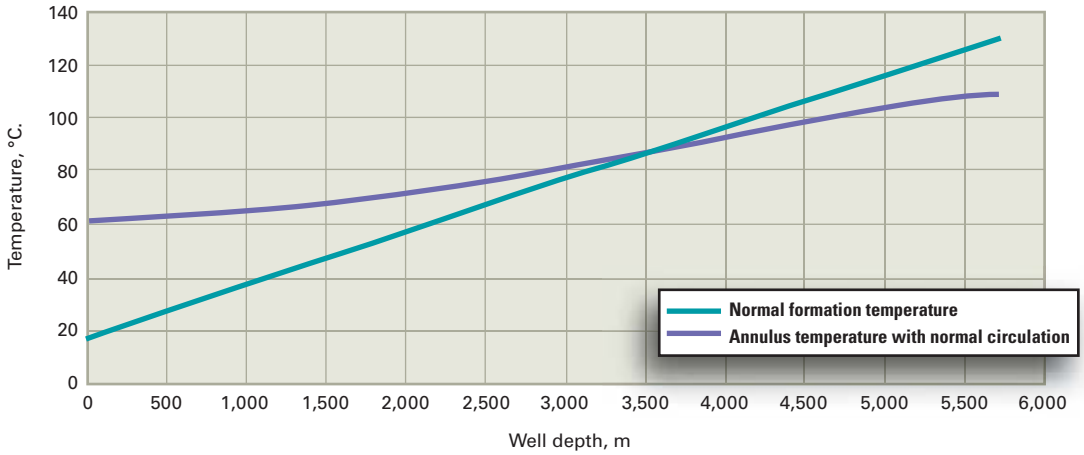
Fig. 1



Source: Reference 3

DRILLING MUD TEMPERATURE

Fig. 2



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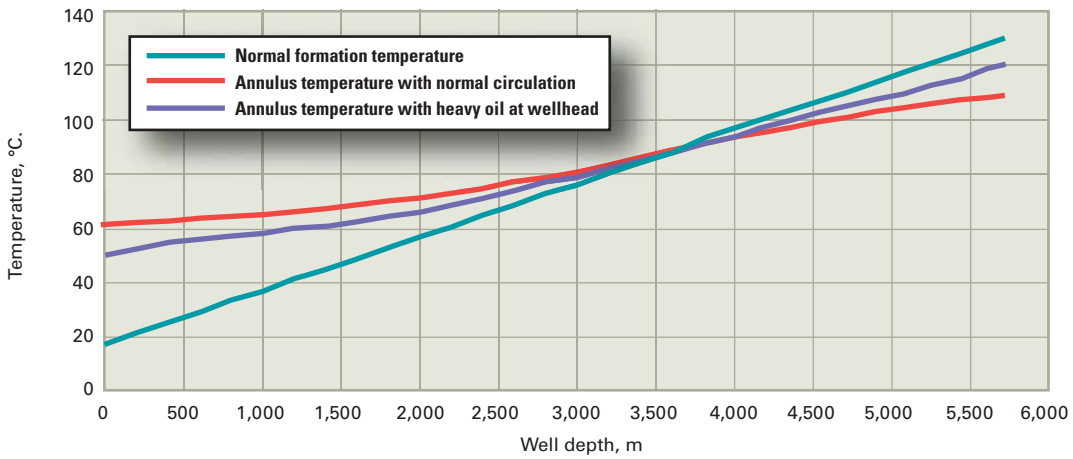
DRILLING MUD, HEAVY OIL TEMPERATURE

Fig. 3



Source: Reference 3

EQUATION

$$\Delta p_{moa} = \frac{0.57503\,\rho_d^{0.8}\,(Q+q)^{1.8}}{(d_h-d_p)^3\,(d_h+d_p)^{1.8}} \int_H^l [\mu_{mo}(T)]^{0.2}\,dh + \frac{0.57503\,\rho_d^{0.8}\,Q^{1.8}}{(d_h-d_p)^3\,(d_h+d_p)^{1.8}} \int_l^0 [\mu_{pv}(T)]^{0.2}\,dh$$

until 22:00, and heavy crude oil flow at the wellhead was 0.7 cu m/hr. Subsequently the drillstring stuck.

The drilling crew rotated the pipe to unfreeze the sticking and continued drilling until no mud circulation returned to the surface at 23:30. The standpipe pressure (SSP) with the blocked annulus was 17 MPa.

Analysis indicated that the formation between 5.919-5923.5 m is a fracture-cavernous heavy-oil zone with a 1.16 formation pressure coefficient that had an estimated oil influx rate of 14 l./sec.

Mechanical analysis

One can approximate the annulus pressure loss of the mixed drilling mud and heavy oil with the equation shown in the equation box.[1]

The terms in the equation are:

- Δp_{moa}—annulus pressure loss of mixed drilling mud and heavy oil.
- ρ_d—drilling mud density.
- Q—drilling mud flow rate.
- q—heavy-oil flow rate into wellbore, which one can estimate with a radial fluid flow model.[2]
- μ_{mo}—mixed drilling mud and heavy oil viscosity.
- T—mixed liquid or drilling mud temperature, also referred to as the wellbore temperature (Fig. 2). Fig. 1 plots the temperature dependence of μ_{mo} for different mixtures with difference amounts of heavy oil.
- μ_{pv}—drilling mud viscosity.
- d_h—borehole diameter.
- d_p—drilling column OD.

Heavy crude takes up the annulus space from depth H to l, while the drilling mud and heavy crude mixture occupies the space from depth l to surface.

After heavy oil flows into the borehole and mixes with the drilling mud, the annulus pressure loss increases and the flow rate of the mixture in the annulus decreases because of the increased viscosity of the mixture as it moves up in the annulus.

At a certain depth, the mixture stops moving up when the temperature reaches the crude oil congealing point, resulting in the blocked annulus.

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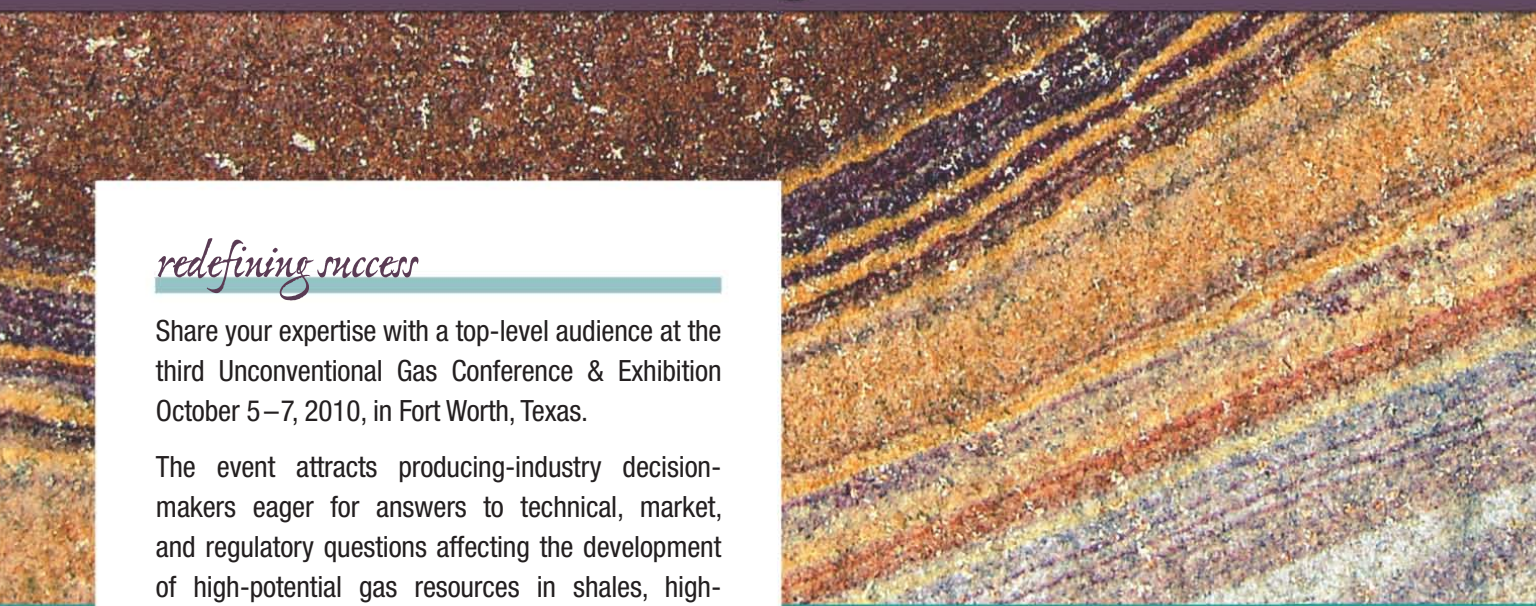

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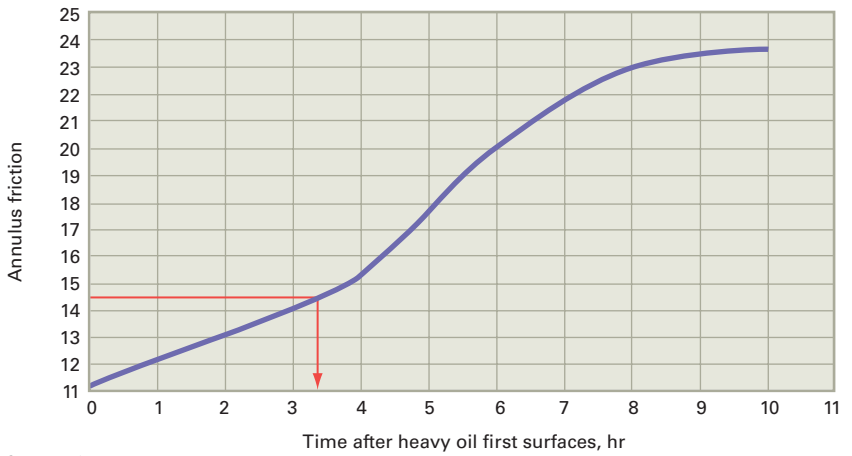
ANNULUS FRICTION

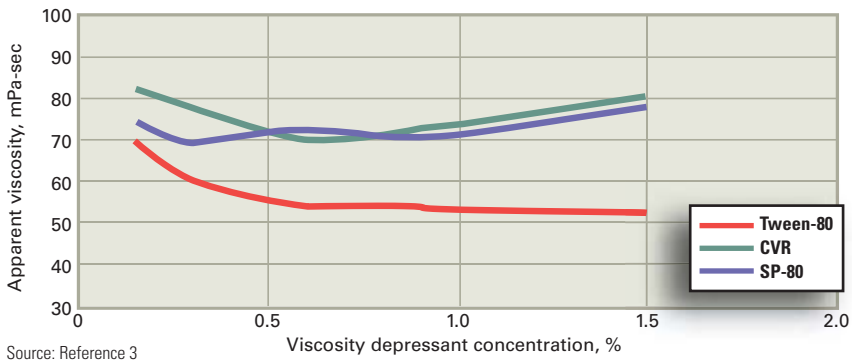
Fig. 4



Source: Reference 3

VISCOSITY DEPRESSANT SELECTION

Fig. 5



Source: Reference 3

One can obtain the annulus blocking time t with an iteration scheme and a comparison of the total borehole flowing friction (Δp_{moa} + flowing friction of drilling mud in the borehole) and the standpipe pressure (SSP), p_s.

To remove the heavy-oil blockage, one needs to apply a blockage-relieving pressure, which equals to the minimum annulus friction for actuating circulation.

Blockage relieving pressure

As Fig. 4 shows,[3] 3.4 hr after the heavy oil first reached surface, the minimum annulus friction that the circulation needs to overcome is 14.55 MPa, and the circulation friction of the drilling mud in the drilling string is 2.56 MPa, computed using the empirical equation in the equation box.

Thus, the total borehole flowing friction (annulus flowing friction + flowing friction of drilling mud in the borehole) is 17.11 MPa, which is greater than the SSP of 17 MPa. Hence, the annulus was blocked and drill pipe stuck.

As time proceeds, the minimum annulus flowing friction that circulation needs to overcome increases; and therefore, restoring circulation requires a greater blockage relieving pressure.

As time increases beyond 9 hr, however, this minimum annulus flowing friction varies very slowly and remains nearly constant.

Based on Fig. 4, the reverse circulation blockage relieving pressure is 25 MPa.

After the well was shut-in, the drilling crew reverse circulated the drilling mud and pumped drilling mud into the annulus to relieve the heavy oil blockage. The drilling mud density was 1.10 g/cc, and the pump pressure was 25 MPa.

The reverse circulation removed the blockage. After removing the blockage, the crew pumped another 80 cu m of drilling mud into the annulus to squeeze the heavy oil back into the fractured formation.

After the drilling operation returned to normal, the crew raised the drilling mud density to 1.15 g/cc. Mud losses, however, continued while drilling deeper.

Because of this, it was decided to

CONVENTIONAL SULFONATED POLYMER MUD PROPERTIES[1]

Table 1

Base mud	pH	KF[2]	Rotation viscometer readout, rpm 600	300	200	100	6	3	Gel strength (10 sec/ 10 min), Pa/Pa	Apparent viscosity, mPa-sec	Plastic viscosity, mPa-sec	Yield point, Pa	API filtrate loss, ml/mm
Before hot rolling	10	0.07	56	35	26	17	3	2	2/10.5	28	21	7	3/0.5
After hot rolling	9	0.06	54	31	24	15	4	3	1.5/10	27	23	4	2.6/0.5

[1]At 130° C. and 16 hr. [2]KF is friction coefficient of mud cake.

SULFONATED POLYMER MUD PROPERTIES*

Table 2

	Name	Rotation viscometer readout, rpm 600	300	200	100	6	3	Gel strength (10 sec/ 10 min), Pa/Pa	Apparent viscosity, mPa-sec	Plastic viscosity, mPa-sec	Yield point, Pa	API filtrate loss, ml/mm
No. 1 base mud	Before hot rolling	56	35	26	17	3	2	2/10.5	28	21	7	3/0.5
	After hot rolling	54	31	24	15	4	3	1.5/10	27	23	4	2.6/0.5
No. 2 = No. 1 + 0.6% CVR	Before hot rolling	57	39	28	19	4	3	2.2/11	28.5	18	10.5	3/1.5
	After hot rolling	55	37	26	17	3	2	1.5/0.5	27.5	18	9.5	2.8/0.5
No. 3 = No. 1 + 0.6% CVR + 30% heavy oil	Before hot rolling	105	66	51	36	20	18	7.0/16.5	52.5	39	13.5	2.9/0.5
	After hot rolling	109	73	56	38	16	13	4.5/11.0	54.5	36	18.5	2.8/0.5

*At 130° C. and 16 hr.

formulate a crude oil emulsifying additive for removing blockages.

Drilling mud design

The usual drilling mud system used in Lunxi heavy-oil formations is sulfonated polymer mud with 4% oil + 0.4% NaOH + 0.2% CMC-LV + 5% SMP-1 + 4% SPNH + 2.0% MHR-86D + 11% pulverized lime.

In the formula, NaOH is sodium hydroxide, CMC-LV is low-viscosity sodium carboxymethylcellulose, SMP-1 is sulfomethylated phenolic resin, SPNH is sulfolignite resin, and MHR-86D is a lubricant.

The properties of the drilling mud comply with API standards (Table 1).

The mud has an API filtration loss after hot rolling at 130° C. of 2.6 ml, friction coefficient of the mud cake of 0.07, and rheological properties within the API standard.

Viscosity depressant selection

In selecting a viscosity depressant, the testing used sulfonated polymer mud as a base mud, and modified muds with three different viscosity depressants: CVR, SP-80, and Tween-80.

CVR is a viscosity reducing emulsifier produced by a Xing Jiang-based Chinese company, SP-80 is a sorbitan monooleate, and Tween-80 is a polyoxyethylene sorbitan monooleate.

Fig. 5 plots the apparent viscosity of the mixture of sulfonated polymer mud with 30% heavy oil vs. the viscosity depressant concentration. The figure shows that the viscosity of the mixture decreases initially with an increase in the concentration of the viscosity depressant.

When the concentration of Tween-80 is 0.6%, the apparent viscosity of the mixture reaches a minimum value 70 mP-sec but increases as the concentration increases.

For the SP-80, the apparent viscosity of the mixture reaches a minimum 70 mP-sec at 0.3% concentration and starts to oscillate with an increase in the concentration more than 0.3%.

For the CVR additive, after hot rolling and subsequent cooling of the mixture to normal temperature, the heavy oil in the mixture became diluted and the base mud and heavy oil dissolve each other when the concentration of CVR rose to 0.6% from 0.15%.

The apparent viscosity of the mixture drops to 54.5 mP-sec, which is the lowest among the three additives.

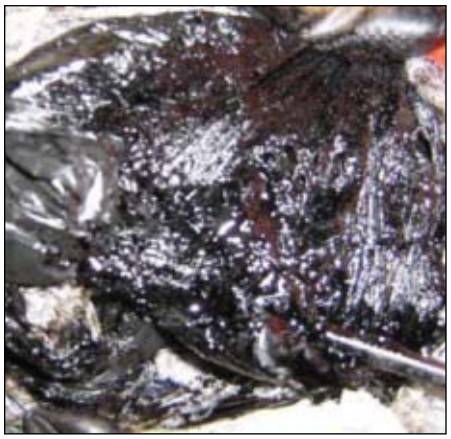
Fig. 6 illustrates the flowability of the hot-rolled mixture and a mixture without hot rolling.

When the concentration of CVR is greater than 0.6%, the apparent viscosity of hot-rolled mixture does not change with CVR concentration

WELL AA701 DRILLING TIME

Table 3

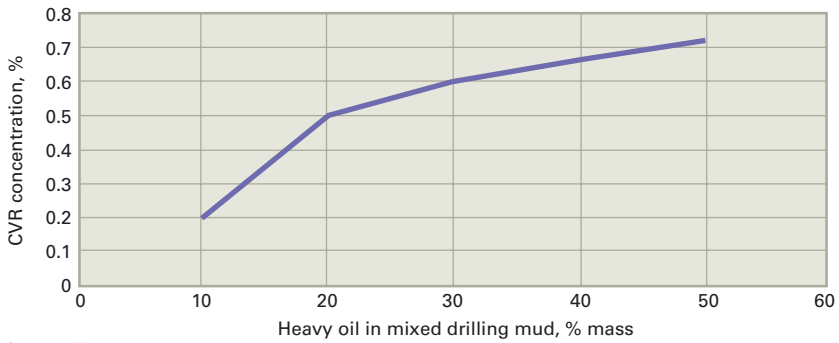
Hole size, in. / Hole interval, m	17½ 0~807.65	9½ ~5,123.00	6 ~5,262.51	Sum	100%
Net drilling time	21:00	333:40	68:20	423:00	27.2
Trip time	23:30	159:10	20:10	202:50	13.04
Pipe connection	7:20	36:00	1:08	44:28	2.86
Reaming time		13:30		13:30	0.87
Well cleanout	2:10	64:20	12:00	78:30	5.05
Electric logging		202:00	20:00	222:00	14.28
Casing running	11:00	35:30		46:30	2.99
Well cementation	124:00	189:30		313:30	20.16
Auxiliary operation		15:10	90:40	105:50	6.81
Bit change		2:10	0:30	2:40	0.17
Sum of productive time	189:00	1,051:00	212:48	1,452:48	93.43
Machine maintenance			0:20	0:20	0.02
Complex situations			101:52	101:52	6.55
Drilling accidents					
Sum of unproductive time			102:12	102:12	6.57
Sum	**189:00**	**1,051:00**	**315:00**	**1,555:00**	**100**



The photos show the flowability of the drilling mud mixture that includes the additive CVR and crude oil. The top photo is without hot rolling and the bottom photo is after hot rolling and cooling (Fig 6).

RECOMMENDED CVR CONCENTRATION

Fig. 7



Source: Reference 3

and remains at 54.5 mP-sec (Fig. 5). Furthermore, increased CVR concentration has no effect on the properties and performance of the mud (Table 2).

The tests, thus concluded that for a mixture of sulfonated polymer mud and 30% heavy oil, 0.6% CVR in the mixture is the optimal choice for reducing apparent viscosity.

Similar experiments showed the effects with various heavy-oil concentrations. Based on these experiments, the optimum formula for the blockage-relieving mud system is 4% oil + 0.4% NaOH + 0.2% CMC-LV + 5% SMP-1 + 4% SPNH + 2.0% MHR-86D + 11% pulverized lime + X% CVR.

The CVR additive percentage X varies with crude oil mass fraction in the mixture, as plotted in Fig. 7.

Field applications

Based on the testing, the recommendation was to add 0.6% CVR to the drilling mud to emulsify the potential mixed liquid in the annulus.

With the recommended drilling mud with the viscosity depressant, two wells, AA45, AA701, were drilled through the Ordovician reservoir beds without problems.

The two wells had boreholes nearly in gauge and experience no drilling pipe sticking induced by heavy oil blockage.

Unproductive time during the drilling was less than 10% (Tables 3 and 4).

Well Lungu 701 was drilled in 64.79 days, 15.21 days ahead of schedule, with a productive time of 93.43%.

The unproductive time of Lungu 45 was 9.78%.

Acknowledgments

This work was supported by the program for new century excellent talents in universities, the Ministry of Education of China, and by the Tarim Oilfield Co. of CNPC. ✦

WELL AA45 DRILLING TIME

Table 4

Hole size Time distribution			First	Second	Third	Sum	%
			Time				
Productive time	Footage working time	Net drilling time	47:30	623:00	18:00	688:30	40.19
		Trip time	15:00	159:00	13:30	187:30	10.95
		Pipe connection	11:00	63:40		74:40	4.36
		Reaming		9:30		9:30	0.55
		Bit change		2:30		2:30	0.15
		Circulation	4:30	74:50	5:30	84:50	4.95
		Sum	78:00	932:30	37:00	1,047:30	61.15
	Electric logging		21:00	25:00	46:00	2.69	
	Cementation		102:30	249:10		351:40	20.53
	Auxiliary operation		13:30	86:50		100:20	5.86
	Sum of production time		194:00	1,289:30	62:00	1,545:30	90.22
Unproductive time	Accidents						
	Machine maintenance						
	Organized shutdown						
	Natural shutdown						
	Complex situations				167:30	167:30	9.78
	Sum of unproductive time				167:30	167:30	9.78
Sum			**194:00**	**1,289:30**	**229:30**	**1,713:00**	**100**

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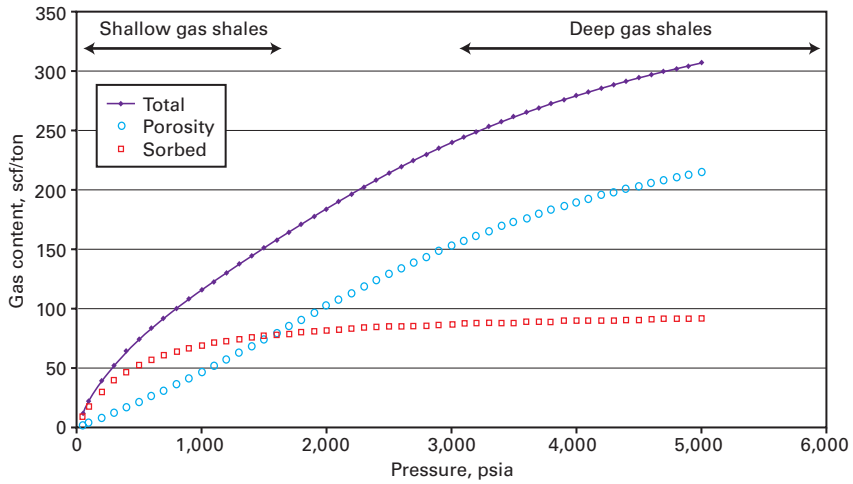
Correction

Two curves in Fig. 2 in the article "GAS SHALE—2: Lessons learned help optimize development" by Vello Kuuskraa and Scott Stevens (OGJ, Oct. 5, 2009, p. 53) had incorrect labels. The corrected figure is:

ADSORPTION ISOTHERM

Fig. 2



MIDYEAR 2009

Global recession, OPEC discipline combine to boost propane prices

Dan Lippe
Petral Worldwide Inc.
Houston

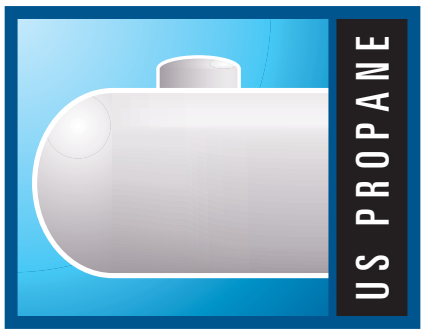
Two factors mainly influenced propane markets and pricing during second and third quarters 2009.

First, the economic recession continued to limit ethylene production and total feedstock demand during second and third quarters 2009. Second, key Organization of Petroleum Exporting Countries' producers maintained reasonably strict adherence to their production quotas in accord with agreements reached in September and December 2008.

Specifically, crude oil production in the Middle East averaged 21.6 million b/d, or 2.2 million b/d less than in third-quarter 2008. OPEC's overall reductions in crude oil production had significant bullish impact on crude oil prices and prices for crude oil-derived ethylene feedstocks during second and third quarters.

Equally important for propane markets, LPG production in Saudi Arabia from gas processing plants declined as a result of crude oil production curtailments on associated gas production. Propane exports from Saudi Arabia averaged 168,000 b/d February-August, or 76,000 b/d (31%) less than the same time period in 2008, according to data complied by Waterborne Energy, Houston. The reduction in propane exports from Saudi Arabia resulted in a tightening international supply-demand balance, while at the same time propane supply in the US remained plentiful.

Propane's use as a space-heating fuel in the residential and commercial markets reaches its seasonal peak each year during fourth and first quarters. Residential-commercial propane demand begins to increase during September-October and usually peaks in December-January.



Feedstock demand

During second-quarter 2009, feedstock demand for propane increased by 55,800 b/d vs. consumption during first-quarter 2009 and averaged 286,000 b/d. This increase was consistent with seasonal patterns, but demand in second-quarter 2009 was 47,000 b/d (14%) less than prerecession demand. We note that feedstock demand for propane averaged 330,000-360,000 b/d during first-half 2008 and reached a peak of 410,000-430,000 b/d in June-July 2008.

Propane demand averaged 335,000-345,000 b/d in July and 320,000-330,000 b/d in August. We estimate demand for third-quarter 2009 averaged 325,000-335,000 b/d for third-quarter 2009.

Table 1 summarizes trends in ethylene feedstock demand for propane.

Ethylene producers operated at 72% of capacity in first-quarter 2009. Our analysis of ethylene production trends indicated ethylene producers continued to limit output in response to heavy liquidation of polyethylene inventory

ETHYLENE FEEDSTOCK DEMAND FOR C_3: 2009

Table 1

Month	Feedstock consumption, 1,000 b/d	Portion of fresh feed, %
January	176.9	14.7
February	230.1	18.3
March	254.4	17.2
April	293.2	18.8
May	269.6	18.0
June	296.2	20.1
July	341.8	22.7
August*	325.0	18.5
September*	318.0	18.5

*Forecast.
Source: Petral Olefin Plant Survey

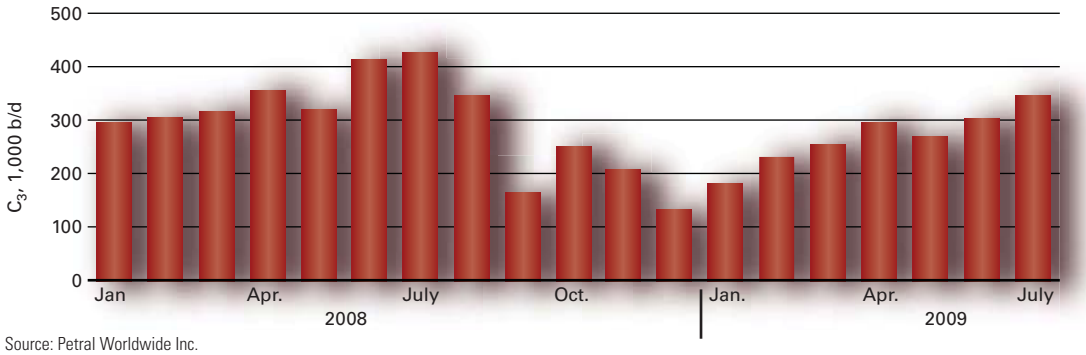
and sharply reduced demand for ethylene.

Inventory liquidation ran its course and ethylene demand began to recover in second-quarter 2009. Specifically, the industry's operating rate improved to 83% in second-quarter 2009 and reached an estimated 85% in third-quarter 2009. Unless global economic growth is much stronger in fourth-quarter 2009, the industry will continue to operate at 85% in fourth-quarter 2009 and first-quarter 2010.

On this basis, total demand for fresh feed will average 1.50-1.55 million b/d during fourth-quarter 2009 and first-quarter 2010. Feedstock demand for propane will reach 275,000-315,000 b/d during winter 2009-10, and propane's share of fresh feed will average 18.0-20.5%. Fig. 1 illustrates historic trends in ethylene feedstock demand for propane.

ETHYLENE FEEDSTOCK DEMAND FOR PROPANE

Fig. 1



Source: Petral Worldwide Inc.

Consistent with the seasonal decline in retail propane sales, propane imports from Canada typically decline to minimum seasonal volumes of 50,000-75,000 b/d during second and third quarters. Additionally, propane imports from international sources (outside North America) usually increase during second and third quarters.

Exports are seldom a significant component of propane supply-demand trends, but prices in the Gulf Coast were at levels that provided economic incentives to international LPG traders to ship record volumes into Europe and Asia during second and third quarters 2009.

Retail demand

Consistent with the seasonal heating degree-days, retail demand fell to its seasonal low during second and third quarters 2009. We estimate that total retail propane sales averaged 380,000-390,000 b/d in second-quarter 2009 and 190,000-210,000 b/d in third-quarter 2009.

Heating degree-days for the winter 2008-09 in key regional markets of the upper Midwest, New England, and Middle Atlantic were generally 5-10% higher than in winter 2007-08. Our forecasts for retail sales during winter 2009-10 are based on average heating degree-days for the winter heating seasons of 2003-08. We note, however, that some early weather forecasts call for a colder-than-average winter.

Retail propane sales typically begin their seasonal increase in September-October and reach their peak in December-January. During a severe winter, retail propane sales will be 10-20% higher than during recent winters. The record high for retail propane sales occurred during winter 2000-01 and totaled an estimated 210 million bbl. Propane supply-demand balances for winter 2009-10, however, are based on total retail sales of 170-180 million bbl. In comparison, retail sales totaled 176 million bbl during winter of 2007-08 and 178 million bbl during 2008-09.

Propane supply

Crude oil prices rebounded strongly during second-quarter 2009 and remained higher than $65/bbl in third quarter, and propane prices increased as well. Natural gas prices, however, continued to decline during second and third quarters 2009. Consequently, profit margins for propane recovery from gas processing plants were sharply higher in second and third quarters 2009.

Profit margins for ethane recovery also improved in second and third quarters 2009. As a result, gas plants had strong economic incentives to operate at maximum NGL recovery—subject only to capacity constraints on raw-mix pipelines and at raw-mix fractionation plants at Mont Belvieu.

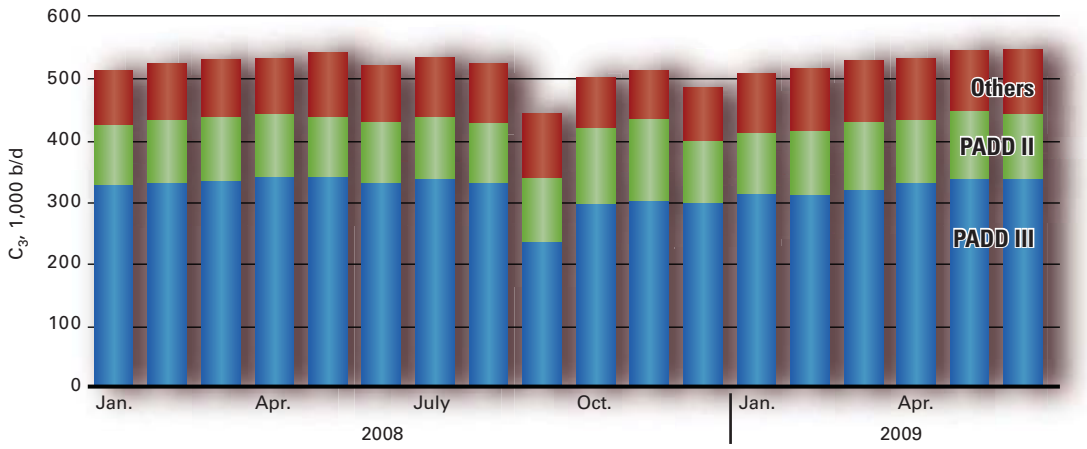
For refineries, economic incentives to move propane into the merchant market also remained strong. Propane prices averaged $8/MMbtu during second-quarter 2009 and increased to $9.50-9.75/MMbtu during third-quarter 2009. Propane prices were $5-7/MMbtu higher than natural gas prices. Refineries had strong economic incentives to sell propane and purchase natural gas.

Based on data published by the US Energy Information Administration, we note that total domestic production from gas plants and net propane production from refineries increased to 881,000 b/d in second-quarter 2009, or 24,000 b/d (2.2 million bbl) higher than year-earlier production volumes.

We estimate that domestic production averaged 865,000-875,000 b/d

US GAS PLANT PROPANE PRODUCTION

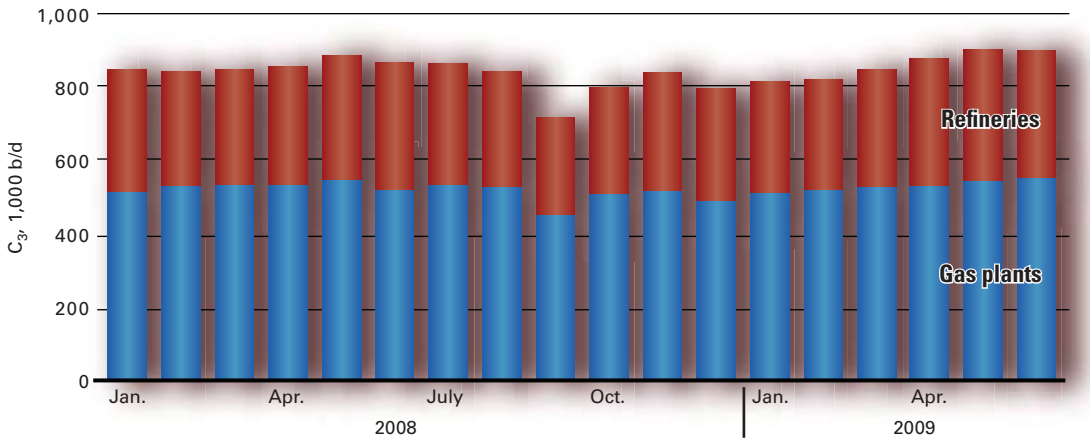
Fig. 2



Source: US Energy Information Administration

TOTAL US PROPANE PRODUCTION

Fig. 3



Source: US Energy Information Administration

during third-quarter 2009 vs. 798,000 b/d in third-quarter of 2008. We forecast domestic production to average 830,000-860,000 b/d during the winter heating season 2009-10 vs. 800,000-820,000 b/d during the winter heating season 2008-09. We note that Hurricane Ike curtailed propane production in fourth-quarter 2008 and first-quarter 2009.

For the winter 2009-10, domestic propane production will total 152 million bbl, or 6 million bbl less than during the winter heating season 2008-09.

Gas plants

EIA statistics indicate that gas plants' propane production averaged 515,000 b/d for first-quarter 2009 and was 3,000 b/d lower than year-earlier volumes. Gas plants' production increased to 539,000 b/d in second-quarter 2009 and was 8,700 b/d higher than year-earlier volumes. Gas plants' production in second-quarter 2009 was the highest volume since second-quarter 2002. We note that gas plants' production in Louisiana during second-quarter 2009 averaged only 73,000 b/d and was 40,000 b/d lower than in second-quarter 2002. After accounting for this variance, aggregate gas plant production from other areas was at record high volumes in second-quarter 2009.

Typically, gas plants' propane production reaches its seasonal peak in the second quarter and generally declines modestly in the third and fourth quarters. Accounting for typical seasonal patterns, we expect gas plants to produce an average 515,000-525,000 b/d in third and fourth quarters 2009.

Fig. 2 illustrates trends in propane production from gas plants.

Refineries

Refinery propane production increased to 342,000 b/d in second-quarter 2009, and we estimate that production averaged 345,000-350,000 b/d in third-quarter 2009. Based on typical seasonal patterns, we forecast production to decline in fourth-quarter 2009 and to average 310,000-330,000 b/d during the 2009-10 winter heating season.

Fig. 3 shows trends in total propane production (gas plants and refineries).

Imports, exports

Based on data from the US Census Bureau's Foreign Trade Division, propane imports from Canada declined in second-quarter 2009 and averaged 70,000 b/d, or 8,000 b/d lower than

Four 58-MW Rolls-Royce Trent GTGs Available for Immediate Delivery

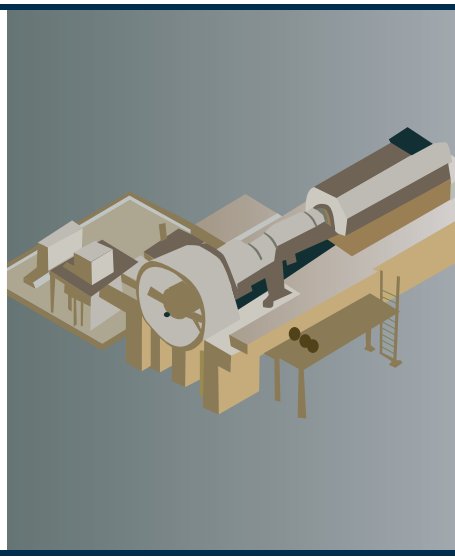
The Rolls-Royce Trent 60 is an advanced aeroderivative gas turbine that delivers up to 58 MW of electric power in simple cycle service. At 42% efficiency, the Trent 60 is highly fuel efficient. It offers operators fast delivery and installation times, and beneficial environmental performance. All or part of the following is available for immediate sale:

- Four Trent 60 Dual WLE GTGs rated at 58 MW with a gross heat rate of 8,592 BTU/kWe.hr (LHV)
- Dual fuel – natural gas and liquid
- Two left-handed units; two right-handed units
- Four generators rated at 13.8 kV, 3 phase, 60 Hz, 0.85 power factor
- Water injection system included
- SCR and carbon monoxide conversion systems with 80-ft stacks
- Acoustic abatement for SCR cladding and silencer
- Water wash system
- Special tools
- GSUs
- Two transformers able to handle two 58-MW units
- GE Prolec 90/120/150 MVA (2 units), with a low voltage 13.8 kV Delta, and a 115 kV Wye HV winding
- Price includes new transformer oil

Two New Alstom 50-Hz Combined Cycle 140-MW Steam Turbine Generators Available for Immediate Shipment

These steam turbine generators (STGs) are new, 140-MW Alstom two-cylinder (HP and IP/LP) reheat condensing steam turbine generator sets suitable for combined cycle outdoor operation with axial exhaust and air-cooled (TEWAC) generator. Initial steam conditions 1900 psia/1050°F/1050°F reheat. Units include manufacturer's performance guarantees and warranties. Units may be shipped directly to your site from Alstom's European manufacturing facility.

- Units come complete with all normally supplied auxiliaries and include factory warranties covering manufacturing defects and performance guarantees.
- Configured as a two-cylinder machine with an HP turbine and a combined IP/LP turbine with an axial exhaust.
- Steam inlet conditions are 1900 psia (nominal)/1050°F/1050°F.
- Air-cooled TEWAC generator rated 165 MVA, 15.75 kV, 3 phase, 50 Hz, 3000 rpm.



Unused GE D11 HP/IP Turbine Assembly Available for Immediate Sale

All parts professionally stored in Pensacola, Florida

Unused GE D11 HP/IP turbine assembly and other miscellaneous parts including LP casings and 304-MW generator stator now available for immediate sale.

Solar Centaur 40 T4701S Turbine Generator Package Now Available

Offered by Williams Field Services Company exclusively through PennEnergy

Solar Centaur 40 T4701S Turbine Generator Package with approximately 60,000 accumulated hours at 50% load. Package was in service from 1999 until August 2007. Engine is BACT compliant with OEM 25 ppm Nox/50 ppm CO guarantee. Operates off SAB-type Ideal generator rated at 3500 kW, 4375 kVA and 13,800 volts at 60 Hz. Miscellaneous equipment includes inlet air filtration and simple exhaust systems, and auxiliary control console with start/stop/sync/control.

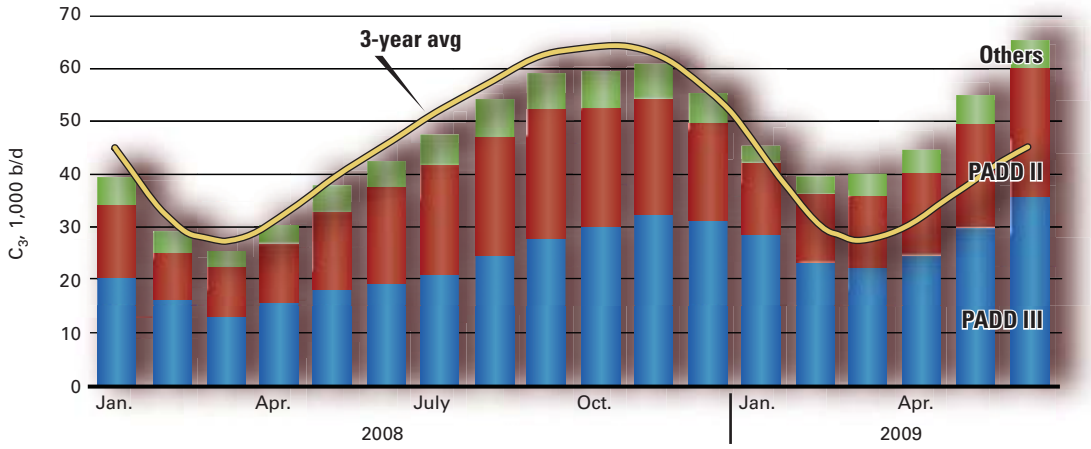
Williams

For Info or Pricing Contact

Randy Hall rhall@pennenergy.com P: 713-499-6330 | Bart Zaino bzaino@thomassenamcot.com P: 817-263-3273

US PROPANE INVENTORY

Fig. 4



Source: US Energy Information Administration

year-earlier volumes and 31,000 b/d less than the average for 2000-05. We estimate that propane imports from Canada increased to 85,000-95,000 b/d in third-quarter 2009, equal to volumes in recent years.

Demand in the northern hemisphere declines to minimum levels during second and third quarters, and international producers usually have surplus cargoes to sell. As a result, waterborne imports into the US usually increase during the off season.

This year, however, due to the decline in supply in the Middle East, international markets had few surplus cargoes. During second-quarter 2009, waterborne imports into the US averaged only 21,000 b/d, or 11,000 b/d less than in 2008 and 57,000 b/d less than in 2007, according to Foreign Trade Division statistics. During third-quarter 2009, waterborne imports were an estimated 25,000-30,000 b/d, or 63,000 b/d (5.8 million bbl) less than in 2008.

Exports from the US are rarely a major factor in the supply-demand balance. Propane prices in Mont Belvieu during second and third quarters 2009, however, were much lower than in international markets. According to EIA statistics, US propane exports averaged 54,000 b/d in second-quarter 2009 and were 6,000 b/d higher than in 2008 but 27,000 b/d higher than in 2007.

Based on loading schedules for third-quarter 2009, we estimate that exports surged to 80,000-90,000 b/d and were 60,000-70,000 b/d (5.5-6.5 million bbl) higher than in 2008. The surge in exports during third-quarter 2009 helped offset the continued impact of subpar ethylene feedstock demand.

Overall inventory trends

Propane inventories typically fall to seasonally minimum levels in mid to late March. Apr. 1 normally marks the beginning of inventory accumulation season for the US. Occasionally, however, propane inventories begin to accumulate as early as mid-March.

In fourth-quarter 2008, propane inventory in primary storage reached its seasonal peak of 57 million bbl (excluding nonfuel propylene) during the second week of November.

Based on EIA statistics for the US and National Energy Board statistics for Canada, propane inventories in North America fell to a seasonal minimum of 42.4 million bbl at the end of February 2009 from a seasonal peak of 70.6 million bbl at the end of October 2008. The seasonal decline of 28.2 million bbl was well below the typical withdrawal of 40-44 million bbl, and total inventories in North America were 9.2 million bbl higher than year earlier levels.

Inventory accumulation rates were higher than average in second-quarter 2009, and inventories for the US and Canada totaled 72.5 million bbl at the end of June 2009 and were 21.9 million bbl higher than year-earlier levels. As a result of the surge in waterborne exports in third-quarter 2009, inventory accumulation rates were below average and total stocks in storage in Canada and the US reached 83.5-84.5 million bbl at the end of September 2009.

At the beginning of the winter heating season, inventories were 12.5-13.5 million bbl higher than in 2008. US inventories reached a peak of 70-72 million bbl. The US inventory peak was 3-5 million bbl lower than was generally expected early in the second quarter.

From a seasonal minimum of 1.3 million bbl on Mar. 1, 2009, purity propane in primary inventory in Canada increased to 9.1 million bbl on Sept. 1, 2009, and was

US PROPANE INVENTORIES: 2009

Table 2

Month	PADD II	PADD III	Other regions	Total
	Million bbl			
January	13.3	28.7	3.59	45.5
February	13.0	23.2	3.58	39.8
March	13.4	22.5	4.05	40.0
April	15.2	24.6	4.68	44.5
May	19.6	29.8	5.60	55.0
June	24.2	35.9	5.22	65.3
July	28.5	35.0	6.24	69.8
August*	29.5	34.0	6.80	70.3
September*	30.5	33.8	7.33	71.6

*Based on weekly survey estimates.

1.3 million bbl more than year-earlier volumes but 0.6 million bbl less than the 5-year average. Based on historic patterns, purity propane inventories in Canada began to decline in September.

Fig. 4 shows trends in US propane inventory.

Regional inventory trends

Propane inventory in primary storage in Petroleum Administration for Defense District II (accompanying box) reached its seasonal minimum at the end of February 2009 and totaled 13.0 million bbl, or 4.3 million bbl more than year-earlier volumes and 2.7 million bbl more than the 5-year average (Table 2).

According to EIA's Petroleum Supply Monthly statistics, propane inventory in PADD II storage increased to 24.2 million bbl at the end of June and was 6.3 million bbl higher than in 2008. Based on EIA weekly reports, inventories in PADD II increased to about 31 million bbl at the end of September.

Propane inventory in primary storage in PADD III (excluding nonfuel propylene) reached its seasonal minimum of 17.9 million bbl in mid-March and totaled 19.5 million bbl at the end of March, according to EIA's Petroleum Supply Monthly statistics. During second-quarter 2009, inventories increased by 13.4 million bbl and totaled 33.5 million bbl at the end of June. At this level, inventories were 16.1 million bbl higher than year-earlier levels and 12.1 million bbl higher than the 5-year average.

According to EIA weekly inventory reports, propane stocks in PADD III were unchanged during early July through late September and totaled about 32.0 million bbl. Typically, inventories in PADD III increase by about 9 million bbl. The surge in waterborne exports and the slump in waterborne imports effectively absorbed the typical increase in inventories during third-quarter 2009.

Pricing, economics

Key OPEC producers maintained strict compliance with their production quotas during second and third quarters 2009 and forward-looking crude oil buyers and traders began to see reasons for optimism for an end to the economic recession. As a result, the crude oil price rally during February-March 2009 was the beginning of a strong rebound rather than an overdue correction, as we had anticipated (OGJ, May 4, 2009, p. 72). As a result, WTI prices averaged $60-70/bbl during second and third quarters 2009.

As expected, however, ethane supplies were plentiful and spot ethane prices remained relatively weak. Competition from ethane for incremental feedstock demand continued to undermine propane's feedstock value.

At the end of the heating season, propane prices in Mont Belvieu averaged 65.2¢/gal in March 2009. The price average for March was 7.4¢/gal lower than the average of 72.6¢/gal for January 2009 despite the increase in West Texas Intermediate crude oil prices of $6.25/bbl. Propane's ratio vs. WTI declined to 57.0% in March 2009 from 73.0% in January 2009. Propane prices fell to a low of 63.4¢/gal in April and the ratio vs. WTI fell to 53.5%.

Prices strengthened in May and June and averaged 72.7¢/gal for second-quarter 2009, or 5¢/gal higher than the average for first-quarter 2009. Despite the price rally in May and June, however, the price ratio vs. WTI averaged only 51.4% in second-quarter 2009 vs. 66.7% in first-quarter 2009. Prices continued to increase in the third quarter and averaged 87¢/gal. Propane's ratio vs. WTI also improved in third-quarter 2009 and averaged 53.6%.

For second-quarter 2009, propane prices averaged 72.7¢/gal, but feedstock parity values vs. light naphthas averaged 87.9¢/gal. The discount of 15.2¢/gal revealed the full impact of plentiful ethane supply and weak ethane prices on propane's market value.

In third-quarter 2009, propane prices averaged 87¢/gal and feedstock parity values vs. light naphthas averaged 97¢/gal. The discount of 10¢/gal

PADD: US Petroleum Administration for Defense Districts*

PAD District I (East Coast) consists of three subdistricts:
- Subdistrict IA (New England): Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont.
- Subdistrict IB (central Atlantic): Delaware, District of Columbia, Maryland, New Jersey, New York, Pennsylvania.
- Subdistrict IC (lower Atlantic): Florida, Georgia, North Carolina, South Carolina, Virginia, West Virginia.

PAD District II (Midwest): Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, Ohio, Oklahoma, Tennessee, Wisconsin.

PAD District III (Gulf Coast): Alabama, Arkansas, Louisiana, Mississippi, New Mexico, Texas.

PAD District IV (Rocky Mountain): Colorado, Idaho, Montana, Utah, Wyoming.

PAD District V (West Coast): Alaska, Arizona, California, Hawaii, Nevada, Oregon, Washington.

*PADDs were delineated during World War II to facilitate oil allocation.
Source: US Energy Information Administration, Washington, DC

showed that propane remained deeply discounted in the Gulf Coast ethylene feedstock market.

These comparisons indicate that the impact of the economic recession on ethylene feedstock demand reinforced the generally bearish impact of the propane inventory surplus. Feedstock parity values vs. ethane, however, averaged 68.4¢/gal in the second quarter (4.3¢/gal lower than spot propane prices) and 85.8¢/gal in third-quarter 2009 (1.3¢/gal lower than propane prices). The narrowing differential between spot prices and propane's feedstock parity values vs. ethane indicate that the surge in waterborne exports from the Gulf Coast during third-quarter 2009 began to counter some of the bearish impact of the inventory surplus.

Winter 2009-10

We expect key OPEC producers to continue to maintain strict compliance with their production quotas during fourth-quarter 2009 and first-quarter 2010. Furthermore, we expect gradual improvement in global economic activity to encourage forward looking crude oil buyers and traders to remain optimistic regarding the global crude oil supply-demand balance in 2010. WTI prices will average $68-72/bbl during fourth-quarter 2009 but will weaken somewhat during first-quarter 2010 and will average $62-67/bbl.

In the Gulf Coast ethylene feedstock market, feedstock demand for ethane exceeded production during first and second quarters 2009 and ethane inventories in the Gulf Coast declined by almost 5 million bbl during January through June 2009. This trend continued during third-quarter 2009.

Most likely, as the ethane supply-demand balance continues to tighten during the winter heating season, spot ethane prices will strengthen. As a result, spot propane prices in Mont Belvieu will average 95-100¢/gal, or 8-18¢/gal higher than during third-quarter 2009. ✦

NELSON-FARRAR COST INDEXES

Refinery construction (1946 basis)
(Explained in OGJ, Dec. 30, 1985, p. 145)

	1962	1980	2006	2007	2008	July 2008	June 2009	July 2009
Pumps, compressors, etc.	222.5	777.3	1,758.2	1,844.4	1,949.8	1,959.0	2,014.7	2,009.0
Electrical machinery	189.5	394.7	520.2	517.3	515.6	517.3	513.7	515.0
Internal-comb. engines	183.4	512.6	959.7	974.6	990.9	990.9	1,019.3	1,029.4
Instruments	214.8	587.3	1,166.0	1,267.9	1,342.1	1,342.4	1,392.7	1,384.6
Heat exchangers	183.6	618.7	1,162.7	1,342.2	1,354.6	1,374.7	1,253.8	1,253.8
Misc. equip. average	198.8	578.1	1,113.3	1,189.3	1,230.6	1,236.9	1,238.8	1,238.4
Materials component	205.9	629.2	1,273.5	1,364.8	1,572.0	1,768.3	1,268.0	1,296.2
Labor component	258.8	951.9	2,497.8	2,601.4	2,704.3	2,681.2	2,813.2	2,815.1
Refinery (Inflation) Index	237.6	822.8	2,008.1	2,106.7	2,251.4	2,316.0	2,195.2	2,207.5

Refinery operating (1956 basis)
(Explained in OGJ, Dec. 30, 1985, p. 145)

	1962	1980	2006	2007	2008	July 2008	June 2009	July 2009
Fuel cost	100.9	810.5	1,569.0	1,530.7	1,951.3	2,800.5	904.5	950.9
Labor cost	93.9	200.5	204.2	215.8	237.9	238.0	258.7	263.1
Wages	123.9	439.9	1,015.4	1,042.8	1,092.2	1,130.3	1,178.9	1,181.5
Productivity	131.8	226.3	497.5	483.4	460.8	475.0	455.7	449.0
Invest., maint., etc.	121.7	324.8	743.7	777.4	830.8	854.6	804.1	808.6
Chemical costs	96.7	229.2	365.4	385.9	472.5	531.8	401.0	406.7
Operating indexes								
Refinery	103.7	312.7	579.0	596.5	674.2	766.4	569.6	578.0
Process units*	103.6	457.5	870.7	872.6	1,045.1	1,350.7	675.6	694.8

*Add separate index(es) for chemicals, if any are used. See current Quarterly Costimating, first issue, months of January, April, July, and October.

These indexes are published in the first issue of each month. They are compiled by Gary Farrar, OGJ Contributing Editor.

Indexes of selected individual items of equipment and materials are also published on the Costimating page in the first issue of the months of January, April, July, and October.

The author

Daniel L. Lippe (danlippe@petral.com) is president of Petral-Worldwide Inc., Houston. He founded Petral Consulting Co. in 1988 and cofounded Petral Worldwide in 1993. He has expertise in economic analysis of a broad spectrum of petroleum products including crude oil and refined products, natural gas, natural gas liquids, other ethylene feedstocks, and primary petrochemicals. Lippe began his professional career in 1974 with Diamond Shamrock Chemical Co., moved into professional consulting in 1979, and has served petroleum, midstream, and petrochemical industry clients since that time. He holds a BS (1974) in chemical engineering from Texas A&M University and an MBA (1981) from Houston Baptist University. He is an active member of the Gas Processors Association, serving on the NGL Market Information Committee.

Pressure isolation facilitates onshore, offshore maintenance

Christopher E. Smith
Pipeline Editor

Pressure isolation and hot tapping, traditionally used for repair, play an increasingly important role in the maintenance and expansion of both offshore and onshore natural gas pipeline systems. An agreement between TDW Offshore Services AS and Amserve Engineering to service Sarawak Shell Berhad's Malaysian pipeline assets serves as one example of this development.

Background

Pipeline pressure isolation typically occurs in conjunction with valve change-outs on export lines in the event of leakage. Offshore isolations of valves with a 24-38 in. bore typically require a four-man crew to launch, monitor, and retrieve a tool such as TDW's SmartPlug. Operations take 2-4 weeks depending on circumstances.

The isolation system avoids:

- Gas flaring, displacement of pipeline contents.
- Production during shutdown repairs.
- Gas, hydrocarbon vapor emissions.
- Holes, future leak paths.
- Decommissioning, recommissioning.
- Hydrate, chemical, contaminated water disposal.

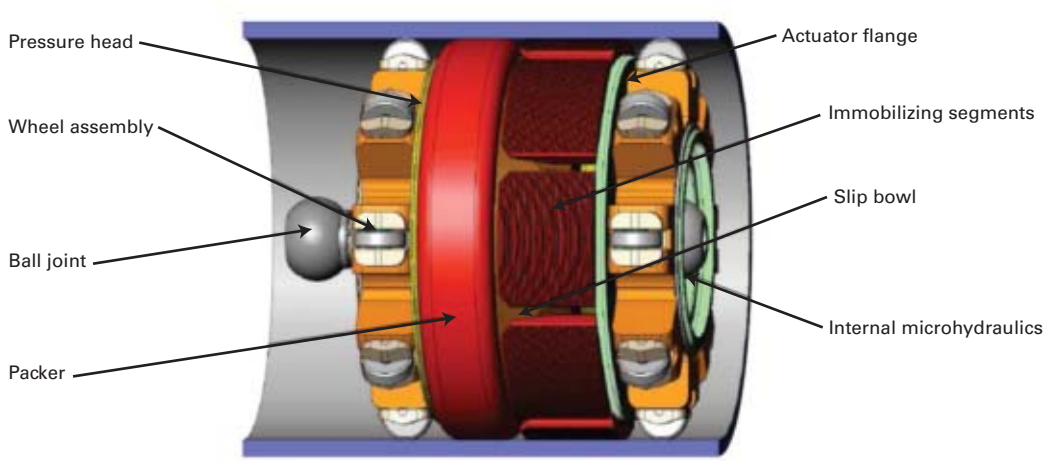
The tool can isolate any pipeline medium, including natural gas, crude oil, distillates, treated or untreated waters, glycol, etc., in pipe of 10-42 in. OD. Each of its two independent plug modules, activated by an onboard microhydraulic system, can isolate the full pipeline pressure, providing double-block isolation. It self-locks in position as long as there's a pressure delta across the tool and can be unset and recovered even if communication fails. Differential pressure produces a thrust load on the tool which it transfers to the pipe wall. The tool communicates with the surface via an ELF antenna allowing two-way contact between it and the operator.

Tool actuation

Threaded hardened steel segments immobilize the tool in the pipeline. Pressurizing the set side of the internal hydraulic cylinder moves the piston from right to left, activating the segments and causing them to slide up the bowl and expand radially.

Machined threads on the outer surfaces of the segments allow their teeth to penetrate the surface of the pipeline's inner wall by a few thousandths of a

PLUG MODULE Fig. 1



Source: Czech Gas Association

millimeter, well within API tolerances. Engaging one third of the segments provides sufficient grip for isolation.[1]

Setting the SmartPlug at the end of a dry pipeline before laying allows dry tie-ins with less expensive vessels and prevents flooding during handover between vessel and platform should a wet buckle occur. Placing one tool on either side of a preinstalled tee allows tie-in of pipelines without shutting down the pipeline, flooding, or environmental remediation.

A team prepares to load the pressure isolation tool into a pig launcher as part of valve replacement at Sarawak Shell Berhad's M3 platform offshore Malaysia (Source: TDW Offshore Services AS; Fig. 2).

Malaysian work

The project for Shell, focused on maintaining and expanding its assets in the region as opposed to addressing an emergency leak, will require double blocks in a number of sections to fully isolate the work area from hydrocarbons. Attempting to perform the work without such blocks would require bleeding of the line, which can be both costly and time consuming.

Work covers Shell's facilities in the South China Sea, off western Borneo, including the M3, B11, E11 RB, F23 and F6 platforms, 80-200 km from Miri and Bintulu, Sarawak. Natural gas currently travels through four trunklines to an onshore processing plant in Bintulu. Shell operates the development for a joint venture between it and Petronas Carigali Sdn. Bhd.

Successful isolations of platforms F23 and M3 have already occurred, with plans in place to tie-in a new line to F23 and replace two valves on E11 RB during the balance of 2009. Plugs used have been assembled, tested, and mobilized from TDW-Stavanger via Labuan, Malaysia.

The E11 Hub integrated gas project, Shell EP Asia Pacific's largest ongoing project, will centralize production from surrounding fields through one integrated hub, shipping processed gas to Petronas's Malaysia LNG Bintulu complex.[2]

The MLNG Bintulu complex, operating since 1983, consists of the Satu, Dua, and Tiga projects, with its combined capacity of 1.1 tcf/year ranking as the largest in the world. An expansion of Dua is scheduled for completion in 2010.[3] As of August 2006 MLNG Japan bought 65% of Bintulu's production, with the balance shipped to Korea (26%) and Taiwan (9%).

Onshore applications

Pressure isolation tools are also becoming more common in onshore applications. The difficultly and expense of otherwise interrupting flow in offshore lines, combined with the greater strength of the lines themselves, saw pressure isolation tools first used in this arena.

As the prices of transported products have risen, however, and environmental concerns and regulations have mounted, in-service pressure isolation has become an increasingly viable alternative for onshore modifications and maintenance as well. The use of external reinforcing clamps has addressed concerns regarding insufficient WT or pipe grade in older high-pressure onshore systems.

A 2007 World Bank document addressing HSE issues related to onshore oil and gas development explicitly calls for safe isolation procedures before

beginning work on existing infrastructure.[4]

Initial onshore use of the tool for a pig trap isolation on Vebundnetz Gas Aktiengesellschaft (VNG) roughly 7,000 km natural gas transmission grid in eastern Germany prevented the loss of about 110,000 cu m of natural gas, any fines or remediation, and re-commissioning of the pipeline itself. A second onshore application isolated 120 m of a 62 km portion of ONTRAS—VNG Gastransport GMBH's to replace the 120-m section without interrupting service.

In both instances 38-in. diameter pressure-isolation pigs were deployed to an excavated section of pipeline roughly 100 m from a pig launcher. Pipeline pressure was held at 50 bar for 3 days during isolation, with each operation taking 10 days from arrival to completion.[1] ✦

References

1. Sim, M., Abdulla, M., and Weissenbock, G., "Non-invasive Remote Pressure Isolation Reduces Flaring and Product Loss," Czech Gas Association, 18th Colloquium, Safety and Reliability of Pipelines, Prague, May 12-13, 2009.
2. http://www.shell.com.
3. http://www.eia.doe.gov/emeu/cabs/Malaysia/NaturalGas.html, September 2009.
4. World Bank Group, International Finance Corp., "Environmental, Health, and Safety Guidelines: Onshore Oil and Gas Development," Apr. 30, 2007.

Correction

In the article "Pipeline profits, capacity expansion plans grow despite increased costs" by Christopher E. Smith, Tables 4, 7, and 8 (OGJ, Sept. 14, 2009, pp. 66, 69, and 70) contained errors. Following are corrected versions of the affected portions of each table. The corresponding data have also been updated in the OGJ Research Center Database.

US PIPELINE COSTS, ESTIMATED

Table 4

Size, in.	Location	Length, miles	$ Material	Labor	Misc.	ROW & damages	Total	$/mile
Total—all projects		2,180.21	$2,857,407,921	$3,084,630,777	$1,654,250,413	$528,337,952	$8,124,627,063	$3,726,534

US PIPELINE COSTS: ESTIMATED VS. ACTUAL, 2008-09

Table 7

Size, in.	Location	Length, miles	$ Materials	Labor	Misc.	ROW & damages	Total	$/mile
Total land, miles		1,356.63						
Estimated			$1,336,456,271	$1,008,573,323	$651,200,708	$92,328,328	$3,088,558,630	$2,276,640
Actual			$1,288,939,308	$1,601,009,922	$636,553,659	$102,670,782	$3,629,173,671	$2,675,139
Total, miles		1,374.37						
Estimated			$1,344,063,685	$1,040,937,992	$665,103,218	$94,703,088	$3,144,807,983	$2,288,181
Actual			$1,298,774,556	$1,668,279,596	$653,650,556	$103,689,096	$3,724,393,804	$2,709,891

US COMPRESSOR-STATION COSTS: ESTIMATED VS. ACTUAL, 2008-09

Table 8

Location	Size, hp	Cost, $ Materials	Labor	Misc.	Land	Total	$/hp
Total	295,156						
Estimated		$251,112,720	$85,719,258	$96,170,550	$2,386,000	$444,720,528	$1,507
Actual		$221,040,858	$177,623,938	$90,232,966	$1,733,367	$490,631,129	$1,662

Tool helps produce marginal wells

The Holey Moley gas diversion tool is designed as a simple, inexpensive way to continue to produce a marginal well.

The company says its product allows you to pump under a packer. It adds that a lease operator no longer has to fear a hole in the casing. At the same time that you avoid an expensive squeeze job you can lower lifting costs and eliminate gas locking, the company points out.

The Holey Moley is inserted into the tubing string to restore production quickly and economically, the firm says. No special tools are required. This patented device can bring stripper wells back from extinction, the company notes. The tool is maintenance free. The Holey Moley also can serve as a tool for gas lifting.

Source: **T-Rex Technology Inc.,** Box 12588, Odessa, TX 79768.

New items for data management, geoscience uses

Newly released Version 5.3 of Recall, a program for managing, storing, and processing wellbore data, includes enhancements to data integration, work flow, search tools, database security, petrophysical sensitivity, and uncertainty analysis.

In conjunction with the release are two new products: Raven and Impetus.

Raven is a new suite of applications that implement an automated validation engine for Recall. These applications run investigations on the data loaded into Recall databases, and provide rule-based evaluation of data quality and metrics. Raven features a graphical explorer-style interactive display, which allows management and technical staff to appraise data integrity and decide how it will be made available to the company's geoscience community.

Impetus is designed for casual or novice users of image data and is based on Recall's Log Image loading, processing, and interpretation software. The emphasis is on guidance, visualization, and ease of use, while adopting a familiar windows-like interface for all operations, wrapped into a single Log Imaging package. Impetus features a guided wizard for preparation of quality images from raw data (from any commercial imaging tool), and the image interpretation module is coupled with 3D viewer and dip pattern analysis tools.

Version 5.3 also includes the RePhine module, a new tool for petrophysical sensitivity and uncertainty analysis. Work flow is further improved through a "transfer bucket" and WITSML loader. Added to this is the PWE Recall browser, a new Recall search tool, and improved Recall database security. Users will be able to see all data associated with the well, view attributes, and select data for download. Individual logs or curves can be selected to be plotted, and the user has control over the depth range to be plotted, plot format, and depth scale.

Source: **Petris Technology Inc.,** 1900 St. James Pl., Suite 700, Houston, TX 77056.

Boots & Coots Inc.,

Houston, and add energy group AS, Stavanger, have entered into a cooperation agreement to market and offer an integrated risk management solution covering blowout prevention, mitigation, response, and related services. The pact gives Boots & Coots exposure to the Norwegian Continental Shelf. Under the agreement, Boots & Coots and add energy will cooperate on well control response and blowout prevention-related risk and engineering services in Norway and on transient hydraulic simulations worldwide. Boots & Coots provides integrated pressure control services to onshore and offshore oil and gas exploration companies worldwide.

Add energy, through its subsidiary add wellflow AS, is a leading supplier of dynamic simulations and flow engineering for well control incidents and contingency planning.

SNF Group,

Andrezieux, France, has committed investments to expand global capacity of polyacrylamides to more than 450,000 tonnes/year from 350,000 tonnes/year over the next 2 years. The polyacrylamides are used mainly in enhanced oil recovery, water treatment, and other industries. SNF is shifting its focus more to the US with its EOR growth market. SNF is building a new plant at Plaquemine, La., with initial capacity of 50,000 tonnes/year during 2010-11, growing to more than 250,000 tonnes/year ultimately. Other new polyacrylamide capacity is planned for China, South Korea, and France.

SNF is one of the world's leading manufacturers of water-soluble polymers and specializes in serving the municipal, industrial, and wastewater treatment industries as well as a wide array of specialty applications.

Northrop Grumman Sperry Marine,

Charlottesville, Va., has won contracts to supply bridge navigation systems for four new offshore oil supply vessels to be built in Brazil. The four multipurpose platform supply vessels, designed by Rolls-Royce, will be built at the Estaleiro Alianca shipyard near Rio de Janeiro for Cia. Brasileira de Offshore. They will be placed on long-term charter with Brazil's state oil company Petroleo Brasileiro SA to provide support services for offshore oil platforms. The scope of supply includes radars, autopilot, speed and heading sensors, and other navigation systems. Last year, Sperry Marine received orders to supply the same navigation packages for four similar vessels at the same shipyard.

Northrop Grumman Sperry Marine, a unit of Northrop Grumman Corp., provides smart navigation and ship control solutions for the international marine industry.

CGGVeritas,

Paris, has announced that Ardiseis, its regional joint venture with TAQA in Oman and the greater Middle East, broke the world record for most vibrating points (VPs) in a single day at 17,011 VPs. The same Omani land acquisition crew at the same time also completed 5 years without a lost-time incident. Having delivered nearly 6 million man-hr, the crew is currently operating with 25,000 channels and moving over 32,000 receivers/day.

CGGVeritas is a leading international pure-play geophysical company delivering a wide range of technologies, services, and equipment (through Sercel) to the global oil and gas industry.

Noah Consulting,

Houston, has opened an office in Calgary, part of an effort to expand its presence in global markets.

Noah Consulting provides information management solutions to a diverse array of industries, including the oil and gas industry. It offers data management, data warehousing, data integration, business intelligence, information quality, and master data management solutions.

Subsea 7 Inc.,

Georgetown, Cayman Islands, has won through its i-Tech division a 5-year ROV contract in excess of $10 million from Mexico's Industrial Perforadora de Campeche SA de CV (IPC). I-Tech will supply an advanced newbuild 3,000 m-rated work-class ROV system and provide IPC with ROV operations, maintenance, and management services for the duration of the contract onboard the La Muralla III newbuild ultradeepwater semisubmersible. Offshore operations will commence upon arrival of the rig in Mexico, currently scheduled for fourth quarter 2010. It is i-Tech's third contract onboard newbuild deepwater drilling rigs in Mexico.

I-Tech is the world's second-largest supplier of ROV support services to the oil and gas exploration and production industry.

Subsea 7 is one of the world's leading subsea engineering and construction companies, offering all the expertise and assets that make SURF (subsea umbilical, riser, and flowline) field development possible. Subsea 7 has a fleet of dynamically positioned ships capable of reeled and flexible pipelay, subsea construction, and saturation diving and a portfolio of pipeline construction yards worldwide.

Iridium Holdings LLC,

Bethesda, Md., has closed on its acquisition by GHL Acquisition Corp., New York. GHL will become Iridium Communications Inc. The previously privately held Iridium also closed on its offering of 16 million newly issued shares of stock. The acquisition and stock issue will enable Iridium to secure funding required for development and launch of its next-generation satellite constellation.

GHL is a special-purpose acquisition company founded by Greenhill & Co. and launched in February 2008 in an initial public offering raising $400 million of gross proceeds.

Iridium is the only provider of mobile satellite communications services offering 100% global coverage, offering voice and data communications services to remote regions for the oil and gas, utilities, mining, and other industries.

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Worldwide Oil Field Production Survey — Field name, field type, discovery date, and depth.
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Enhanced Oil Recovery Survey — Covers active, planned and terminated projects worldwide. Updated biennially in March.
E1048 Current E1148C Historical, 1986 to current

Worldwide Gas Processing Survey — Gas processing plants worldwide with details.
E1209 Current E1219C Historical, 1985 to current

International Ethylene Survey — Information on country, company, location, capacity, etc.
E1309 Current E1309C Historical, 1994 to current

LNG Worldwide — Facilities, Construction Projects, Statistics
LNGINFO

Worldwide Construction Projects — List of planned construction products updated in May and November each year.

	Current	Historical 1996–Current
Refinery	E1340	E1340C
Pipeline	E1342	E1342C
Petrochemical	E1341	E1341C
Gas Processing	E1344	E1344C

U.S. Pipeline Study — There are 14 categories of operating and financial data on the liquids pipeline worksheet and 13 on the natural gas pipeline worksheet.
E1040

Worldwide Survey of Line Pipe Mills — Detailed data on line pipe mills throughout the world, process, capacity, dimensions, etc.
PIPEMILL

OGJ 200/100 International Company Survey — Lists valuable financial and operating data for the largest 200 publicly traded oil and gas companies.
E1345 Current E1145C Historical 1989 to current

Oil Sands Projects — Planned Canadian projects in four Excel worksheets. Includes mining, upgrading, in situ projects, and historical table with wells drilled back to 1985.
OILSANDPRJ

Production Projects Worldwide — List of planned production mega-projects.
PRODPROJ

See website for prices

www.ogjresearch.com

Imports of crude and products

	Districts 1-4		District 5		Total US		
	10-16 2009	10-9 2009	10-16 2009	10-9 2009	10-16 2009	10-9 2009	*10-17 2008
	1,000 b/d						
Total motor gasoline	639	648	10	42	649	690	1,062
Mo. gas. blending comp.	568	489	4	0	572	489	744
Distillate	86	124	34	40	120	164	181
Residual	103	248	115	0	218	248	186
Jet fuel-kerosine	25	5	49	84	74	89	85
Propane-propylene	100	162	10	9	110	171	243
Other	598	629	51	54	649	683	887
Total products	**2,119**	**2,305**	**273**	**229**	**2,392**	**2,534**	**3,388**
Total crude	**7,830**	**7,316**	**869**	**1,415**	**8,699**	**8,731**	**10,400**
Total imports	**9,949**	**9,621**	**1,142**	**1,644**	**11,091**	**11,265**	**13,788**

*Revised.
Source: US Energy Information Administration
Data available in OGJ Online Research Center.

Purvin & Gertz LNG netbacks—Oct. 23, 2009

Receiving terminal	Liquefaction plant					
	Algeria	Malaysia	Nigeria	Austr. NW Shelf	Qatar	Trinidad
	$/MMbtu					
Barcelona	6.13	4.07	5.32	3.97	4.64	5.24
Everett	4.18	2.79	3.82	2.88	3.00	4.46
Isle of Grain	4.43	3.02	3.81	2.99	3.17	3.84
Lake Charles	2.57	1.26	2.47	1.43	1.66	3.04
Sodegaura	4.92	7.03	5.17	6.73	6.01	4.43
Zeebrugge	5.71	3.94	5.05	3.87	4.34	5.11

Definitions, see OGJ Apr. 9, 2007, p. 57.
Source: Purvin & Gertz Inc.
Data available in OGJ Online Research Center.

Crude and product stocks

District	Crude oil	Motor gasoline		Jet fuel, kerosine	Fuel oils		Propane–propylene
		Total	Blending comp.[1]		Distillate	Residual	
	1,000 bbl						
PADD 1	14,445	55,656	37,551	12,545	74,097	13,783	5,072
PADD 2	77,082	49,646	25,242	8,093	32,818	1,050	30,306
PADD 3	178,817	67,900	41,012	14,888	47,643	15,353	34,318
PADD 4	15,539	5,933	1,889	543	3,398	230	[1]2,156
PADD 5	53,189	27,810	23,550	9,070	11,932	3,766	—
Oct. 16, 2009	**339,072**	**206,945**	**129,244**	**45,139**	**169,888**	**34,182**	**71,852**
Oct. 9, 2009	**337,760**	**209,159**	**127,511**	**45,336**	**170,672**	**35,071**	**72,969**
Oct. 17, 2008[2]	**311,380**	**196,497**	**101,016**	**36,579**	**124,304**	**37,359**	**61,111**

[1]Includes PADD 5. [2]Revised.
Source: US Energy Information Administration
Data available in OGJ Online Research Center.

Refinery report—Oct. 16, 2009

District	REFINERY OPERATIONS		REFINERY OUTPUT				
	Gross inputs	Crude oil inputs	Total motor gasoline	Jet fuel, kerosine	Fuel oils		Propane–propylene
					Distillate	Residual	
	1,000 b/d						
PADD 1	1,289	1,271	2,408	53	426	123	54
PADD 2	2,958	2,950	2,180	173	866	54	257
PADD 3	7,021	6,888	2,188	624	1,987	318	688
PADD 4	535	535	319	24	183	12	[1]63
PADD 5	2,526	2,426	1,362	388	431	166	—
Oct. 16, 2009	**14,329**	**14,070**	**8,457**	**1,262**	**3,893**	**673**	**1,062**
Oct. 9, 2009	**14,295**	**14,097**	**8,453**	**1,321**	**3,876**	**660**	**1,037**
Oct. 17, 2008[2]	**14,925**	**14,562**	**8,961**	**1,388**	**4,439**	**488**	**1,021**
	17,672 Operable capacity		**81.1% utilization rate**				

[1]Includes PADD 5. [2]Revised.
Source: US Energy Information Administration
Data available in OGJ Online Research Center.

Additional analysis of market trends is available through **OGJ Online**, *Oil & Gas Journal's* electronic information source, at http://www.ogjonline.com.

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OGJ crack spread

	*10-23-09	*10-24-08	Change	Change, %
	$/bbl			
SPOT PRICES				
Product value	86.08	80.05	6.03	7.5
Brent crude	77.35	64.78	12.57	19.4
Crack spread	8.74	15.27	–6.53	–42.8
FUTURES MARKET PRICES				
One month				
Product value	85.85	75.46	10.39	13.8
Light sweet crude	80.35	68.78	11.57	16.8
Crack spread	5.50	6.68	–1.18	–17.7
Six month				
Product value	92.59	82.30	10.29	12.5
Light sweet crude	82.80	71.19	11.61	16.3
Crack spread	9.78	11.12	–1.33	–12.0

*Average for week ending.
Source: Oil & Gas Journal
Data available in OGJ Online Research Center.

OGJ GASOLINE PRICES

	Price ex tax 10-21-09	Pump price* 10-21-09	Pump price 10-22-08
	¢/gal		
(Approx. prices for self-service unleaded gasoline)			
Atlanta	212.9	244.3	299.7
Baltimore	204.2	246.1	298.0
Boston	205.4	247.3	297.3
Buffalo	196.1	259.3	283.4
Miami	210.4	263.3	294.9
Newark	204.4	237.3	287.2
New York	191.1	254.3	300.6
Norfolk	199.6	237.3	283.5
Philadelphia	203.6	254.3	299.3
Pittsburgh	202.6	253.3	297.7
Wash., DC	214.7	256.6	298.2
PAD I avg	204.1	250.3	294.5
Chicago	224.9	280.0	300.0
Cleveland	228.5	274.9	281.5
Des Moines	214.6	255.0	280.2
Detroit	228.4	280.0	294.1
Indianapolis	214.9	265.0	289.1
Kansas City	204.3	240.0	270.4
Louisville	224.0	264.9	290.2
Memphis	203.2	243.0	274.2
Milwaukee	215.0	266.3	294.1
Minn.-St. Paul	218.4	264.0	284.0
Oklahoma City	195.6	231.0	250.6
Omaha	193.6	239.3	268.7
St. Louis	199.3	235.0	282.8
Tulsa	185.9	221.3	261.8
Wichita	196.6	240.0	276.5
PAD II avg	209.8	253.3	279.9
Albuquerque	202.6	239.8	280.9
Birmingham	206.2	245.5	270.2
Dallas-Fort Worth	200.9	239.3	268.4
Houston	201.6	240.0	259.6
Little Rock	195.9	236.1	273.9
New Orleans	208.4	246.8	290.0
San Antonio	204.4	242.8	276.5
PAD III avg	202.9	241.5	274.2
Cheyenne	215.3	247.7	291.8
Denver	215.8	256.2	317.7
Salt Lake City	208.3	251.2	301.8
PAD IV avg	213.1	251.7	303.8
Los Angeles	233.0	298.8	330.3
Phoenix	221.6	259.0	317.3
Portland	238.2	281.6	322.3
San Diego	234.3	300.1	337.3
San Francisco	240.5	306.3	342.4
Seattle	239.7	295.6	327.3
PAD V avg	234.6	290.2	329.5
Week's avg.	**210.9**	**255.7**	**291.6**
Sept. avg.	**211.0**	**256.6**	**367.2**
Aug. avg.	**209.9**	**255.5**	**375.3**
2009 to date	**180.6**	**226.2**	--
2008 to date	**308.2**	**352.2**	--

*Includes state and federal motor fuel taxes and state sales tax. Local governments may impose additional taxes.
Source: Oil & Gas Journal.
Data available in OGJ Online Research Center.

REFINED PRODUCT PRICES

	10-16-09 ¢/gal		10-16-09 ¢/gal
Spot market product prices			
Motor gasoline (Conventional-regular)		Heating oil No. 2	
New York Harbor	199.93	New York Harbor	200.25
Gulf Coast	196.93	Gulf Coast	199.50
Los Angeles	200.18	Gas oil	
Amsterdam-Rotterdam-Antwerp (ARA)	187.95	ARA	198.81
Singapore	192.33	Singapore	196.55
Motor gasoline (Reformulated-regular)		Residual fuel oil	
New York Harbor	197.43	New York Harbor	165.12
Gulf Coast	195.31	Gulf Coast	169.12
Los Angeles	212.18	Los Angeles	175.26
		ARA	164.23
		Singapore	169.86

Source: DOE Weekly Petroleum Status Report.
Data available in OGJ Online Research Center.

BAKER HUGHES RIG COUNT

	10-23-09	10-24-08
Alabama	6	5
Alaska	5	7
Arkansas	38	57
California	23	48
Land	22	48
Offshore	1	0
Colorado	36	124
Florida	0	2
Illinois	0	1
Indiana	0	2
Kansas	24	11
Kentucky	11	12
Louisiana	163	189
N. Land	108	78
S. Inland waters	11	24
S. Land	14	26
Offshore	30	61
Maryland	0	0
Michigan	0	2
Mississippi	7	16
Montana	3	8
Nebraska	2	0
New Mexico	47	93
New York	3	4
North Dakota	51	83
Ohio	8	10
Oklahoma	73	187
Pennsylvania	59	29
South Dakota	0	2
Texas	398	920
Offshore	3	7
Inland waters	0	0
Dist. 1	26	28
Dist. 2	14	38
Dist. 3	27	65
Dist. 4	32	83
Dist. 5	65	187
Dist. 6	43	131
Dist. 7B	8	28
Dist. 7C	31	64
Dist. 8	71	125
Dist. 8A	16	27
Dist. 9	26	42
Dist. 10	36	95
Utah	16	32
West Virginia	21	29
Wyoming	42	77
Others—HI-1; NV-2; OR-2; TN-1; VA-5	11	14
Total US	**1,048**	**1,964**
Total Canada	**244**	**447**
Grand total	**1,292**	**2,411**
US Oil rigs	312	423
US Gas rigs	725	1,529
Total US offshore	34	73
Total US cum. avg. YTD	**1,079**	**1,881**

Rotary rigs from spudding in to total depth.
Definitions, see OGJ Sept. 18, 2006, p. 42.

Source: Baker Hughes Inc.
Data available in OGJ Online Research Center.

SMITH RIG COUNT

Proposed depth, ft	Rig count	10-23-09 Percent footage*	Rig count	10-24-08 Percent footage*
0-2,500	59	3.3	87	3.4
2,501-5,000	68	67.6	148	47.9
5,001-7,500	117	18.8	264	15.9
7,501-10,000	228	6.1	456	2.6
10,001-12,500	198	14.1	457	0.6
12,501-15,000	158	1.8	373	—
15,001-17,500	143	—	166	—
17,501-20,000	59	—	78	—
20,001-over	38	—	29	—
Total	**1,068**	**10.7**	**2,058**	**6.3**
INLAND	17		31	
LAND	1,014		1,973	
OFFSHORE	37		54	

*Rigs employed under footage contracts.
Definitions, see OGJ Sept. 18, 2006, p. 42.

Source: Smith International Inc.
Data available in OGJ Online Research Center.

OGJ PRODUCTION REPORT

	[1]10-23-09	[2]10-24-08
	1,000 b/d	
(Crude oil and lease condensate)		
Alabama	21	22
Alaska	702	702
California	650	653
Colorado	67	67
Florida	5	6
Illinois	27	26
Kansas	111	113
Louisiana	1,420	612
Michigan	17	18
Mississippi	64	62
Montana	86	86
New Mexico	168	164
North Dakota	1,206	198
Oklahoma	179	178
Texas	1,401	1,185
Utah	64	63
Wyoming	147	145
All others	67	74
Total	**6,402**	**4,374**

[1]OGJ estimate. [2]Revised.

Source: Oil & Gas Journal.
Data available in OGJ Online Research Center.

US CRUDE PRICES

	10-23-09 $/bbl*
Alaska-North Slope 27°	65.67
South Louisiana Sweet	80.50
California-Kern River 13°	69.90
Lost Hills 30°	80.30
Wyoming Sweet	72.25
East Texas Sweet	76.50
West Texas Sour 34°	72.00
West Texas Intermediate	77.00
Oklahoma Sweet	77.00
Texas Upper Gulf Coast	70.00
Michigan Sour	69.00
Kansas Common	75.75
North Dakota Sweet	66.75

*Current major refiner's posted prices except North Slope lags 2 months. 40° gravity crude unless differing gravity is shown.

Source: Oil & Gas Journal.
Data available in OGJ Online Research Center.

WORLD CRUDE PRICES

$/bbl[1]	10-16-09
United Kingdom-Brent 38°	71.47
Russia-Urals 32°	71.37
Saudi Light 34°	70.14
Dubai Fateh 32°	71.35
Algeria Saharan 44°	71.99
Nigeria-Bonny Light 37°	72.87
Indonesia-Minas 34°	74.90
Venezuela-Tia Juana Light 31°	71.56
Mexico-Isthmus 33°	71.45
OPEC basket	71.58
Total OPEC[2]	71.12
Total non-OPEC[2]	70.71
Total world[2]	70.94
US imports[3]	69.62

[1]Estimated contract prices. [2]Average price (FOB) weighted by estimated export volume. [3]Average price (FOB) weighted by estimated import volume.

Source: DOE Weekly Petroleum Status Report.
Data available in OGJ Online Research Center.

US NATURAL GAS STORAGE[1]

	10-16-09	10-9-09	10-16-08	Change, %
	bcf			
Producing region	1,187	1,182	914	29.9
Consuming region east	2,041	2,030	1,979	3.1
Consuming region west	506	504	443	14.2
Total US	**3,734**	**3,716**	**3,336**	**11.9**
	July 09	**July 08**	**Change, %**	
Total US[2]	**3,086**	**2,516**	**22.7**	

[1]Working gas. [2]At end of period.
Source: Energy Information Administration
Data available in OGJ Online Research Center.

Statistics

PACE REFINING MARGINS

	Aug. 2009	Sept. 2009	Oct. 2009	Oct. 2008	– 2009 vs. 2008 – Change	Change, %
			$/bbl			
US Gulf Coast						
West Texas Sour	7.34	3.15	2.63	7.69	–5.06	–65.8
Composite US Gulf Refinery	9.24	4.35	3.97	7.39	–3.42	–46.3
Arabian Light	7.75	0.19	0.79	6.11	–5.32	–87.1
Bonny Light	2.76	0.94	1.49	1.09	0.40	37.1
US PADD II						
Chicago (WTI)	7.82	3.74	2.68	18.78	–16.10	–85.7
US East Coast						
NY Harbor (Arab Med)	7.06	0.19	–0.37	6.76	–7.13	–105.5
East Coast Comp-RFG	7.13	2.91	4.22	7.63	–3.41	–44.7
US West Coast						
Los Angeles (ANS)	15.12	16.08	9.42	11.12	–1.70	–15.3
NW Europe						
Rotterdam (Brent)	1.50	1.64	1.02	5.12	–4.10	–80.1
Mediterranean						
Italy (Urals)	–0.21	–0.45	–1.72	7.42	–9.14	–123.2
Far East						
Singapore (Dubai)	1.64	1.30	–0.68	2.23	–2.91	–130.5

Source: Jacobs Consultancy Inc.
Data available in OGJ Online Research Center.

US NATURAL GAS BALANCE DEMAND/SUPPLY SCOREBOARD

	July 2009	June 2009	July 2008	July 2009-2008 change	Total YTD 2009	Total YTD 2008	YTD 2009-2008 change
				bcf			
DEMAND							
Consumption	1,643	1,524	1,709	–66	13,563	14,176	–613
Addition to storage	413	449	430	–17	2,106	1,858	248
Exports	68	67	66	2	632	603	29
Canada	36	37	31	5	427	354	73
Mexico	28	28	30	–2	184	222	–38
LNG	4	2	5	–1	21	27	–6
Total demand	**2,124**	**2,040**	**2,205**	**–81**	**16,301**	**16,637**	**–336**
SUPPLY							
Production (dry gas)	1,775	1,737	1,787	–12	12,289	12,000	289
Supplemental gas	5	2	4	1	35	29	6
Storage withdrawal	83	62	88	–5	1,843	2,221	–378
Imports	303	283	322	–19	2,182	2,328	–146
Canada	257	231	287	–30	1,878	2,111	–233
Mexico	2	1	4	–2	18	13	5
LNG	44	51	31	13	286	204	82
Total supply	**2,166**	**2,084**	**2,201**	**–35**	**16,349**	**16,578**	**–229**

NATURAL GAS IN UNDERGROUND STORAGE

	July 2009	June 2009	May 2009	July 2008	Change
			bcf		
Base gas	4,266	4,260	4,253	4,228	38
Working gas	3,086	2,752	2,367	2,516	570
Total gas	**7,352**	**7,012**	**6,620**	**6,744**	**608**

Source: DOE Monthly Energy Review.
Data available in OGJ Online Research Center. **NOTE: No new data at press time.**

WORLDWIDE NGL PRODUCTION

	July 2009	June 2009	7 month average production 2009	7 month average production 2008	Change vs. previous year Volume	Change vs. previous year %
			1,000 b/d			
Brazil	73	65	79	87	–8	–9.5
Canada	586	486	567	648	–80	–12.4
Mexico	366	363	371	370	1	0.2
United States	1,884	1,901	1,848	1,845	3	0.1
Venezuela	200	200	200	200	—	—
Other Western Hemisphere	188	191	202	195	7	3.6
Western Hemisphere	**3,297**	**3,206**	**3,266**	**3,344**	**–78**	**–2.3**
Norway	285	241	278	293	–15	–5.2
United Kingdom	127	132	140	174	–34	–19.7
Other Western Europe	9	11	10	10	—	3.0
Western Europe	**421**	**383**	**427**	**476**	**–49**	**–10.3**
Russia	401	428	410	421	–11	–2.6
Other FSU	150	150	150	150	—	—
Other Eastern Europe	14	14	15	16	–1	–4.7
Eastern Europe	**565**	**592**	**575**	**586**	**–12**	**–2.0**
Algeria	347	338	341	355	–13	–3.7
Egypt	70	70	70	70	—	—
Libya	80	80	80	80	—	—
Other Africa	131	131	131	130	1	1.0
Africa	**628**	**619**	**623**	**635**	**–12**	**–1.9**
Saudi Arabia	1,547	1,482	1,397	1,440	–43	–3.0
United Arab Emirates	250	250	250	250	—	—
Other Middle East	835	836	835	878	–43	–4.9
Middle East	**2,632**	**2,568**	**2,482**	**2,568**	**–86**	**–3.3**
Australia	74	82	68	65	3	4.7
China	650	650	650	624	26	4.1
India	—	—	—	—	—	—
Other Asia-Pacific	169	169	169	179	–10	–5.6
Asia-Pacific	**893**	**901**	**887**	**868**	**19**	**2.2**
TOTAL WORLD	**8,436**	**8,269**	**8,260**	**8,478**	**–218**	**–2.6**

Totals may not add due to rounding.
Source: Oil & Gas Journal.
Data available in OGJ Online Research Center.

OXYGENATES

	July 2009	June 2009	Change	YTD 2009	YTD 2008	Change
			1,000 bbl			
Fuel ethanol						
Production	22,577	20,822	1755	140,873	120,227	20,646
Stocks	14,294	13,903	391	14,294	13,186	1,108
MTBE						
Production	1,566	1,561	5	10,463	11,169	–706
Stocks	659	811	–152	659	1,252	–593

Source: DOE Petroleum Supply Monthly.
Data available in OGJ Online Research Center. **NOTE: No new data at press time.**

US COOLING DEGREE-DAYS

	Aug. 2009	Aug. 2008	Normal	2009 % change from normal	Total degree-days Jan. 1 through Aug. 31 2009	2008	Normal	% change from normal
New England	208	86	146	42.5	359	436	395	–9.1
Middle Atlantic	251	154	205	22.4	553	645	592	-6.6
East North Central	165	162	197	–16.2	475	572	641	–25.9
West North Central	191	221	255	–25.1	633	714	828	–23.6
South Atlantic	439	389	393	11.7	1,589	1,582	1,497	6.1
East South Central	360	361	376	–4.3	1,281	1,311	1,276	0.4
West South Central	555	509	527	5.3	2,139	2,019	1,929	10.9
Mountain	325	336	302	7.6	1,084	1,076	1,017	6.6
Pacific	239	263	193	23.8	667	710	538	24.0
US average*	**309**	**281**	**290**	**6.6**	**1,003**	**1,034**	**986**	**1.7**

*Excludes Alaska and Hawaii.
Source: DOE Monthly Energy Review.
Data available in OGJ Online Research Center. **NOTE: No new data at press time.**

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Climate change poses new threat: a litigation spree

Common sense on climate change is pinned down by crossfire among the three branches of US government.

Congress is contriving cap-and-trade legislation that would expensively overhaul energy markets and has potential, according to a report for the American Petroleum Institute by Ensys Energy, to shutter a third of US refining capacity by 2030. The Obama administration craves a climate change bill to flaunt at an international summit on the subject in December. So the Environmental Protection Agency threatens to exercise authority it received in a 2007 Supreme Court decision to regulate greenhouse gases under the Clean Air Act. That decision, which will be activated when EPA makes final its obedient finding last April that greenhouse gases endanger public health, essentially classified carbon dioxide, a compound essential to life, as an air pollutant.

The Editor's Perspective

by Bob Tippee, Editor

And the tort bar smells money.

Suppliers of fossil fuels are being sued on grounds their products aggravate global warming, which have caused geophysical phenomena from which plaintiffs suffered loss. By that logic, oil companies and others have been blamed for damage from Hurricane Katrina in 2005, for erosion of a barrier island in Alaska, and for other calamities.

Until recently, defendants' lawyers have prevailed with arguments based on absence of merit or plantiffs' legal standing.

In two cases, though, the plaintiffs have won reversals on appeal (OGJ Online, Oct. 22, 2009). The result, warns Peter Glaser, chair of the Climate Change Practice Team in the Washington, DC, office of Troutman Sanders LLP, is a "potentially massive number of lawsuits."

If weather damage can be blamed on climate processes presumptively caused by emissions of carbon dioxide, any emitter of the substance is a potential defendant.

That, of course, would include anyone who breaths. But oil companies and electric utilities have more money.

Preventing a proliferation of lawsuits, which would make the MTBE litigation spree of the early part of this decade look like a warm-up, might require an act of Congress.

As Glaser points out, however, the political cost of legislative repair anytime soon would be support for the cap-and-trade wrecking ball now under design.

(Online Oct. 23, 2009; author's e-mail: bobt@ogjonline.com)

Market Journal

by Sam Fletcher, Senior Writer

US mileage and oil-price patterns

The Department of Transportation said total miles driven in the US during August were up 0.7% from the same period in 2008, following a 2.3% gain in July.

Total miles driven this year through August equaled mileage driven in the same 8-month period in 2008, DOT said. However, Jacques H. Rousseau, an analyst at Soleil-Back Bay Research, noted, "It is important to remember that 2008 was a leap year and included an extra day in February, so on a daily basis, miles driven are up 0.5% year-to-date."

Still, said Olivier Jakob at Petromatrix, Zug, Switzerland, "What is more worrying is that August is declining vs. July, and this goes against the normal seasonal trend." He said, "Apart from the low levels of 2008, we have to go back to 2003 to find a comparable low Vehicles Miles Traveled during August."

As crude prices hit a 12-month high of $82/bbl on the New York market Oct. 21, Jakob said, "Change in driving patterns is a multiweek rather than an overnight process, and the vehicles miles data shows that the US driving patterns did not start to change in the summer of 2008 when crude was at $147/bbl but in the fourth quarter of 2007 when crude prices were starting to break above $80/bbl. They started to increase again only after a few months of crude oil at sub-$50/bbl."

Hence, he said, "We have to start being cautious on the forward outlook for US gasoline demand on a price elasticity basis. With the high level of stocks and poor refining margins, [US] imports of gasoline have been sharply reduced; but with the widening premium of West Texas Intermediate to North Sea Brent, the arbitrage economics on gasoline are starting to improve while the US cracks should at the same time sponsor some incremental supplies."

Meanwhile, data released by the Association of American Railroads for the week ended Oct. 17 showed North American rail volume to be still 18.6% below last year (US down 15.4%, Canada down 10.4%, Mexico down 9.5%). "These year-on-year comparisons should start to improve due to the base effect of the end of October 2008 collapse, but they are nonetheless proof of a recovery that is only timid and in that environment we will have to start watching for any negative price impact on oil demand if the [recent oil price] rally was to continue," Jakob said.

US inventories

The Energy Information Administration said commercial US inventories of crude increased by 1.3 million bbl to 339.1 million bbl in the week ended Oct. 16—the latest period at presstime last week. Gasoline stocks fell 2.3 million bbl to 206.9 million bbl. Distillate fuel inventories decreased by 800,000 bbl to 169.9 million bbl. Imports of crude into the US dipped by 32,000 b/d to 8.7 million b/d that week. In the 4 weeks through Oct. 16, crude imports were 310,000 b/d below the same period in 2008.

Input of crude into US refineries declined 27,000 b/d to 14.1 million b/d in the final week with units operating at 81.1% of capacity. Gasoline production was virtually unchanged at 8.5 million b/d, but distillate fuel production increased slightly to 3.9 million b/d.

Rousseau said, "Refined product inventories (gasoline plus distillate plus jet fuel) fell 3.3 million bbl (0.8%)...due to lower supply. Refiners continued to operate at very low levels because of weak refining margins, and imports fell to their lowest level of the year. After showing signs of improvement the last 3 weeks, gasoline demand dropped to under 9 million b/d, according to the EIA. Inventories of distillate remain very high heading into winter." He foresees weak earnings in the refining sector into 2010.

Meanwhile, Jakob said open interest in reformulated blend stock for oxygenate blending (RBOB) futures continues to increase, reaching the previous peak levels of last May. "Gasoline demand on the 4-week average [through Oct. 16] is 4.2% higher than a year ago, but we need to point to some flags on demand. Comparing recent demand to a year ago has been made somewhat difficult given the hurricane disruptions last year, but overall demand on the 4-week average is now even slightly lower than a year ago with a continued deficit of distillate demand," he said.

In the rest of the world, German consumer stocks of heating oil remain at multi-year highs, and it will take an extreme winter to make room for the stocks of distillates "that have been sent from Asia to float in European waters," Jakob said.

(Online Oct. 26, 2009; author's e-mail: samf@ogjonline.com)

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