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OGJ150/100

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Improving thin, light-oil reservoir recoveries
Correlation predicts flue gas sulfuric acid dewpoints
China's strategic reserves capacity to double by 2011

OIL&GAS JOURNAL®

Sept. 21, 2009
Volume 107.35

OGJ150/100

Regular Features

Cover

After several years of dwindling to fewer than 150 companies and known as the OGJ200, our exclusive report has a new name: OGJ150. Despite high prices for oil and gas in 2008, many companies in the annual ranking of the US-based, publicly traded oil and gas producers posted negative net income. The group as a whole posted a 32% loss compared with a year ago. This special report, along with the annual results of the OGJ100 group of oil and gas producers based outside the US, begins on p. 22.

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General Interest

Exploration & Development

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Processing

Transportation

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OGJ News
Please submit press releases via e-mail to: news@ogjonline.com

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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:

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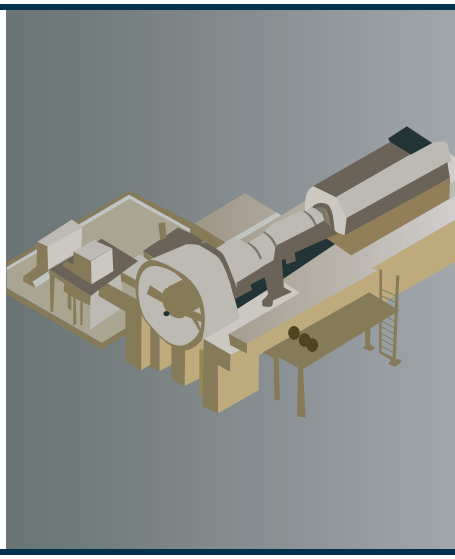
Two New Alstom 50-Hz Combined Cycle 140-MW Steam Turbine Generators Available for Immediate Shipment

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

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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.

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OGJ Newsletter

Sept. 21, 2009

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General Interest — Quick Takes

Gorgon LNG partners given final approval

The giant Gorgon-Jansz-Io LNG and domestic gas project off Western Australia has been given a final investment green light by the joint venture partners Chevron Corp., ExxonMobil Corp., and Royal Dutch Shell PLC.

In 2009 dollars, the cost of the development is $43 billion (Aus.).

With a total gas resource estimate of 40 tcf, the project will be the largest for resources development in Australia's history.

Preparatory work on the proposed Barrow Island LNG and domestic plant site will begin immediately with full construction timed to begin in February 2010.

Contracts valued at $2 billion (Aus.) have already been let and a further $10 billion (Aus.) worth of contracts will be awarded before yearend.

First LNG deliveries are expected to start in 2014. Domestic gas is slated to come on stream by yearend 2015.

The project comprises two subsea pipelines, one each from subsea wells on the Gorgon and the Jansz-Io fields. The gas will be piped to Barrow Island where three 5 million tonne/year LNG trains will be constructed along with a 300 terajoules/day domestic gas plant. Domestic sales gas will be piped to the mainland to connect with the main Dampier to Bunbury gas trunkline. LNG will be shipped direct to customers overseas from a loading jetty to be built on Barrow.

Carbon dioxide extracted from the project—mostly from Gorgon field—will be geosequestered by injection directly into storage reservoirs 2,000 m beneath the island.

The estimated economic life of the project is presently put at 40 years.

Gorgon field was first discovered by West Australian Petroleum in 1981 while nearby Jansz and Io were found in the 1990s by ExxonMobil and BP PLC, respectively.

Chevron has signed sales agreements with Osaka Gas, Tokyo Gas, and GS Caltex (of South Korea) for a total of more than 4 million tonnes/year of LNG. ExxonMobil has sales agreements with Petronet of India and PetroChina for its share of LNG production. Shell has yet to confirm its supply deals.

Chevron has 50% of the project (47.75% once equity sales are approved to Osaka Gas and Tokyo Gas). ExxonMobil and Shell each have 25%.

BP sees US biofuels consumption climbing

BP PLC expects biofuels will become a larger part of the US motor fuel market, probably displacing more gasoline than diesel, said Katrina Landis, chief executive officer of BP Alternative Energy, at the Offshore Europe Conference.

"Diesel use is growing in the US, following the trend set by Europe, and biodiesel is expected to provide around 8% of the fuel for diesel-powered engines by 2030," Landis said.

During that same period, biofuels are expected to take the place of about 25% of the gasoline market, she said. "US production of biofuels is expected to grow from less than 0.5 million b/d in 2007 to 2.3 million b/d in 2030," she added.

BP has a joint venture with Martek Biosciences Corp. to produce ethanol from sugarcane, and BP is working with DuPont Corp. to produce biobutanol at Saltend, Hull, UK.

In the US, BP has a joint venture with Verenium Corp., Cambridge, Mass., to develop a commercial-scale cellulosic ethanol plant in Highlands County, Fla. Plans call for the plant to produce 36 million gal/year by 2012. ✦

Exploration & Development — Quick Takes

Libya to invest $10 billion in development

Libya plans to invest 12.1 billion dinars ($9.92 billion) in the development of 24 wells in fields it calls "technically, financially, and economically proven."

The investment will be undertaken by Libya's state-owned National Oil Corp (NOC), its subsidiaries, and current foreign partners, according to an official statement issued after a cabinet meeting.

"No new parties would be allowed to participate in that plan," said the statement, according to the government news agency Jana.

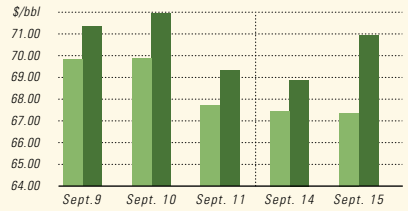
The government's plan calls for boosting production from the Waha-Jalou oil field by 100,000 b/d at a cost of 1.6 billion dinars and increasing output at the Nafoora-Oujlaa-Khleej oil field by 130,000 b/d at a cost of 1.3 billion dinars. No other details were released.

Analyst BMI said Tripoli's move to prioritize contract awards to existing players in the Libyan upstream "may present opportunities" to Italy's Eni SPA, France's Total SA, Spain's Repsol YPF SA, and Austria's OMV AG.

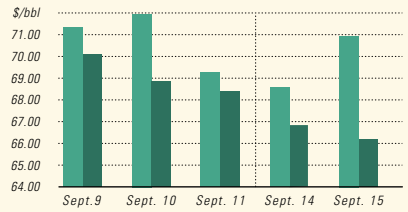
However, the analyst expects "BP and Royal Dutch Shell to avoid making any high-profile new investment deals with Libya in the immediate term" in order to disassociate themselves and the British government from suggestions that oil industry concerns in Libya may have motivated the release of convicted Lockerbie bomber Abdel Baset al-Megrahi on Aug 20.

Industry Scoreboard

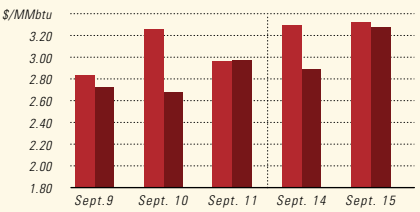
IPE BRENT / NYMEX LIGHT SWEET CRUDE



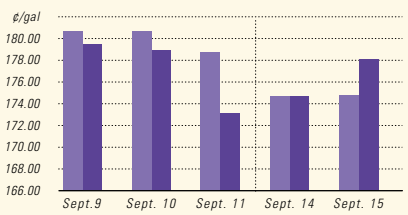
WTI CUSHING / BRENT SPOT



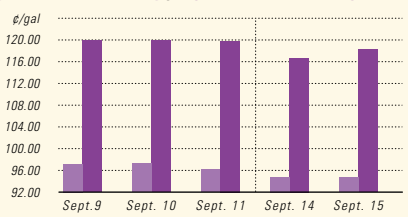
NYMEX NATURAL GAS / SPOT GAS - HENRY HUB



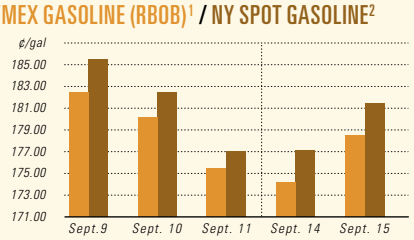
IPE GAS OIL / NYMEX HEATING OIL



PROPANE - MT. BELVIEU / BUTANE - MT. BELVIEU



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



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

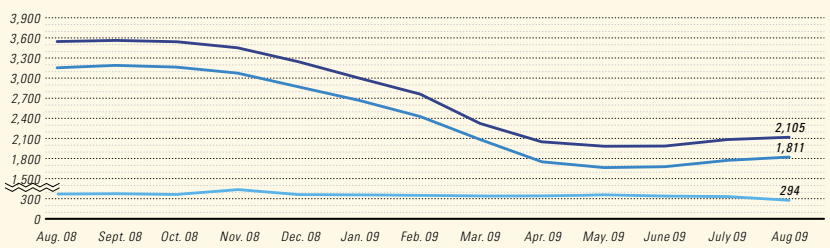
US INDUSTRY SCOREBOARD — 9/21

Latest week 9/4	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	9,268	9,066	2.2	9,008	9,057	–0.5
Distillate	3,464	3,668	–5.6	3,612	3,968	–9.0
Jet fuel	1,461	1,622	–9.9	1,395	1,590	–12.3
Residual	566	512	10.5	584	633	–7.7
Other products	4,738	4,251	11.5	4,182	4,505	–7.2
TOTAL DEMAND	19,497	19,119	2.0	18,781	19,753	–4.9
Supply, 1,000 b/d						
Crude production	5,213	4,791	8.8	5,223	5,075	2.9
NGL production[2]	2,168	2,176	–0.4	2,000	2,148	–6.9
Crude imports	9,002	10,123	–11.1	9,265	9,889	–6.3
Product imports	2,397	2,828	–15.2	2,772	3,152	–12.1
Other supply[3]	1,652	1,514	9.1	1,715	1,544	11.1
TOTAL SUPPLY	20,432	21,432	–4.7	20,975	21,808	–3.8
Refining, 1,000 b/d						
Crude runs to stills	14,486	14,635	–1.0	14,486	14,697	–1.4
Input to crude stills	14,846	15,028	–1.2	14,846	15,038	–1.3
% utilization	84.1	85.3	—	84.1	85.4	—

Latest week 9/4	Latest week	Previous week[1]	Change	Same week year ago[1]	Change	Change, %
Stocks, 1,000 bbl						
Crude oil	337,482	343,388	–5,906	298,034	39,448	13.2
Motor gasoline	207,153	205,085	2,068	187,942	19,211	10.2
Distillate	165,556	163,563	1,993	130,460	35,096	26.9
Jet fuel-kerosine	45,341	45,755	–414	39,815	5,526	13.9
Residual	33,583	33,892	–309	36,695	–3,112	–8.5
Stock cover (days)[4]			Change, %		Change, %	
Crude	22.9	23.6	–3.0	20.3	12.8	
Motor gasoline	22.4	22.3	0.4	20.1	11.4	
Distillate	47.8	48.2	–0.8	31.6	51.3	
Propane	65.8	63.7	3.3	56.2	17.1	
Futures prices[5] **9/11**			Change		Change	%
Light sweet crude ($/bbl)	70.91	68.41	2.50	108.30	–37.39	–34.5
Natural gas, $/MMbtu	2.96	2.75	0.21	7.32	–4.36	–59.5

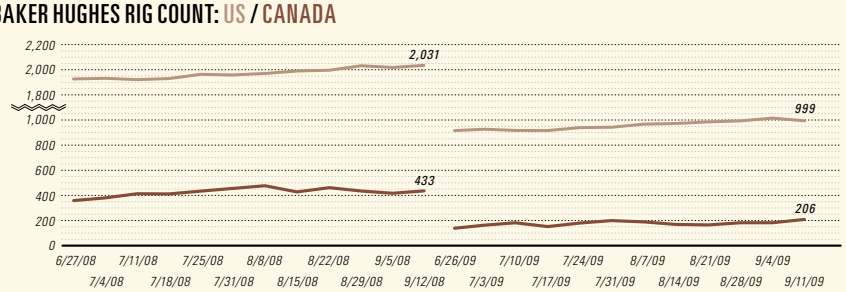
[1]Based on revised figures. [2]Includes adjustments for fuel ethanol and motor gasoline blending components. [3]Includes other hydrocarbons and alcohol, refinery processing gain, and unaccounted for crude oil. [4]Stocks divided by average daily product supplied for the prior 4 weeks. [5]Weekly average 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

Last week, US Sen. Charles E. Schumer called on the British government not to bid on or agree to any oil contract with Libya after speculation that Megrahi's release was due to a secret deal between the British and Libyan governments.

"If the British government wants to dispel these disturbing rumors once and for all, agreeing to Libyan oil contracts is not the way to do it," Schumer said. "The Libyans have clearly shown their disdain for the international community by holding a welcome home ceremony for this terrorist, but it's up to the British to show the world that they reject the Libyans' foul actions."

BP nonetheless plans to drill its first Libyan well in the second half of 2010 as part of a $900 million exploration program, according to company spokesman, David Nicholas.

BP signed an accord with NOC in May 2007 during a visit by then-British Prime Minister Tony Blair. The agreement allows BP to explore 21,000 sq miles and in 2007 the company said it planned to drill at least 17 exploration wells.

West of Shetland gas find under appraisal

A group led by DONG Energy AS is considering whether to drill a sidetrack to appraise a gas discovery on the Glenlivet license west of the Shetland Islands off the UK.

The well in the P1195 license encountered the prognosed gas pay in Paleocene sandstone. Cores, logs, and sampling revealed 61 m of net gas pay with excellent reservoir and saturation parameters.

The Transocean Rather deepwater semisubmersible is drilling the well near the Laggan and Tormore gas discoveries, in which DONG Energy holds 20% interest, in the Faroe-Shetland Channel (see map, OGJ, Aug. 20, 2007, p. 38).

DONG Energy operates P1195 with 80% interest. Faroe Petroleum PLC and First Oil Expro Ltd. have 10% each.

DONG Energy was awarded interests in 21 exploration blocks covering 3,600 sq km in the region around the West of Shetlands in November 2008. DONG Energy operates four of the blocks.

Brunei exploratory drilling on tap in 2010

Two groups plan to drill at least four exploration wells onshore Brunei in 2010.

Kulczyk Oil Ventures Inc., Calgary, formerly Loon Energy Inc., offered to buy private Sydney firm Triton Hydrocarbons Pty. Ltd., which has a 36% interest in 744,000-acre Block M that contains undeveloped Belait oil and gas field.

Shareholders of more than 75% of Triton stock accepted the offer. Closing is expected in mid-September.

Tap Oil Ltd., Perth, operates Block M, which is just south of 550,000-acre Block L, in which Kulczyk Oil holds 40% interest (OGJ Online, Sept. 1, 2009).

Tap Oil shot 118 sq km of 3D seismic and 60 line-km of 2D seismic on Block M in the second and third quarters of 2009. It plans to drill two wells in 2010 and a third well by August 2011. Kulczyk Oil noted that four prospects on Block M were categorized as prospective resources because of the lack of discovery wells and production tests.

Once Kulczyk Oil acquires Triton, Brunei National Petroleum Co. Sdn. Bhd. has the right to acquire Kulczyk Oil's interest in Block M.

Nations Southeast Asia Ltd., Calgary, operator of Block L, shot 350 sq km of 3D seismic in the southwest part of the block earlier this year near adjacent Seria oil field, which had produced more than 1 billion bbl of oil by 1991.

Nations plans to drill two exploration wells starting in the first quarter of 2010 on Block L, where the last well, Jerudong-11, was drilled in 1986, Kulczyk Oil said.

Brunei Shell Petroleum Co. announced a large dry, sweet gas discovery in three formations just offshore at Bubut, less than 1 km from the Block L boundary (OGJ Online, Nov. 15, 2007).

Kulczyk Oil noted that Triton also owns 35% of Mauritania International Petroleum Inc., which holds 100% interest in four contiguous exploration blocks off Mauritania.

Triton also owns 50% of Triton Petroleum Pte. Ltd., or Triton Singapore, which owns a 20% beneficial interest in a production-sharing agreement that covers Syria's Block 9, where Kulczyk Oil plans to shoot a large 3D seismic survey by June 2010. Triton Singapore will be led by the current management of Triton, who are pursuing development opportunities in southern Iraq. ✦

Drilling & Production — *Quick Takes*

Pan Orient to buy Indonesian interests from Fuel-X

Pan Orient Energy Corp., Calgary, agreed to buy Indonesian interests held by Fuel-X International Inc. of Alberta, which was placed in receivership in September 2007.

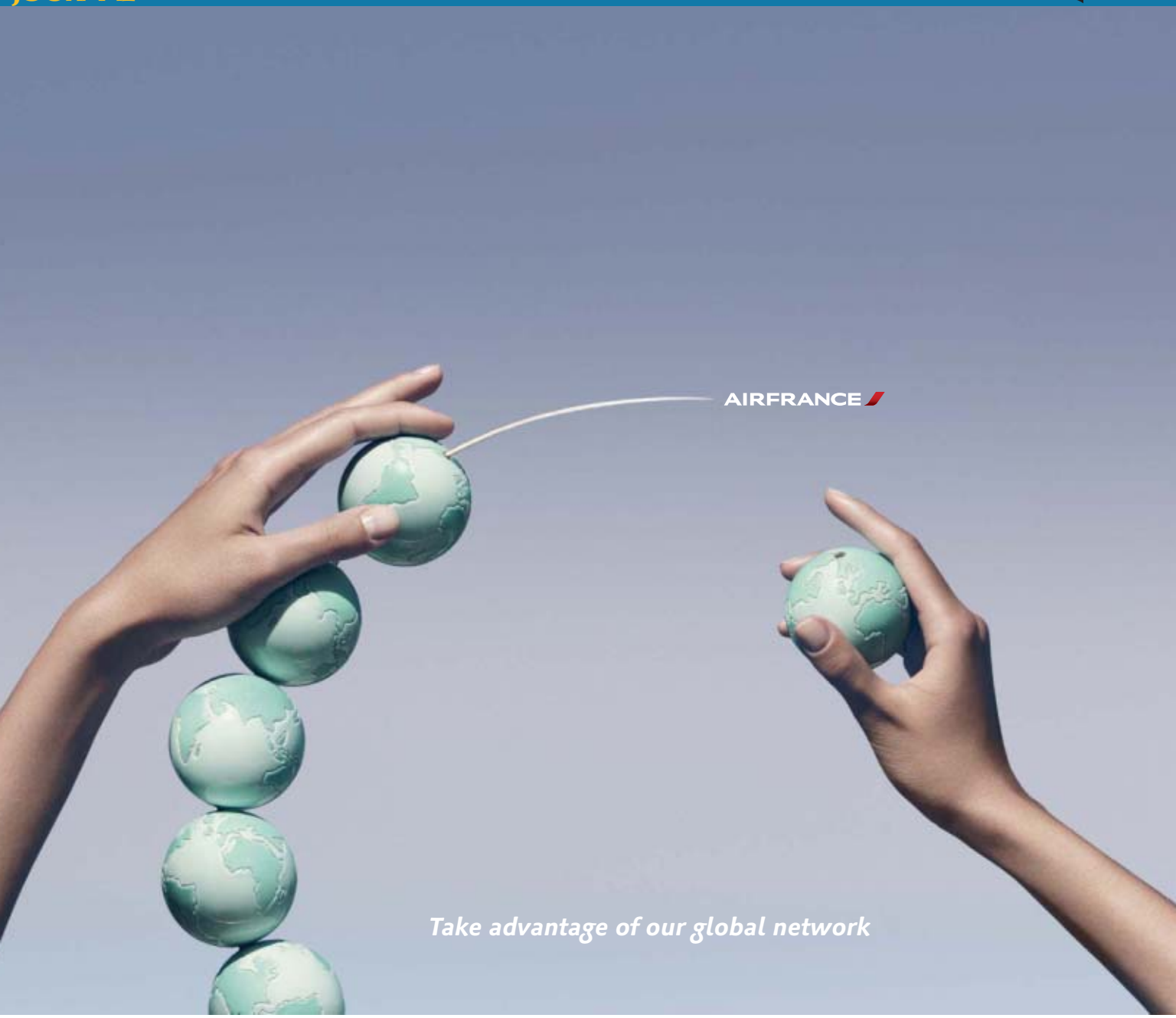
The main interest is a 30% nonoperated interest in the 2,285 sq km Tungkal production-sharing contract in South Sumatra. The other interest is a $5 million receivable payable upon first commercial gas delivery from Ruby gas field in the Sebuku PSC off East Kalimantan (OGJ Online, May 2, 2007). Development was approved in mid-2008.

The purchase price, $7.5 million (Can.) in Pan Orient stock, will be adjusted for revenue, expenses, and capital outlays related to the 30% participating interest in the Tungkal PSC from Aug. 31 to the closing date, and these adjustments will be paid largely in cash.

The Tungkal PSC has several discoveries, including Mengoepeah South in 2007, the discovery well encountering 70 m of net oil pay and testing at a combined rate of more than 2,000 b/d of oil above 1,200 m true vertical depth. Gross production is 800 b/d, of which 240 b/d is net to the Fuel-X interest.

Indonesia approved a revised Mengoepeah development plan in April that includes up to 10 development wells and the workover of existing wells. Development drilling is under way and anticipated to be completed by yearend with a target of gross production of 2,000-3,000 b/d, or 600-900 b/d net to the Fuel-X interest.

One high impact exploration well is to spud in the fourth quarter and be completed by yearend. Tungkal is next to the Pan Orient-operated Batu Gajah PSC, where seismic is being shot and a multiwell exploration drilling program is to start in the first half of 2010.



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Volund field off Norway starts producing

Marathon Petroleum Co. (Norway) LLC started production from Volund field on Block 24/9 in the Norwegian North Sea.

The field consists of three subsea-completed wells tied back 8 km to the Alvheim floating, production, storage, and offloading vessel. Water depth at Volund is 120-130 m.

Volund is the second tieback to the Marathon-operated FPSO. The StatoilHydro-operated Vilje field began producing to the FPSO from two subsea-completed wells in August 2008 (OGJ, Aug. 11, 2008, Newsletter).

Marathon says current oil production to the Alvheim FPSO is about 140,000 bo/d, or about 20,000 b/d more than the nameplate capacity. The first Volund well, therefore, will function as a swing producer until a natural decline starts in the Alvheim fields, likely by the middle of 2010, the company says.

Marathon expects Volund to reach a peak oil production of about 25,000 b/d, the timing of which is subject to available processing capacity on the FPSO.

Operator Marathon holds a 65% interest in Volund, while its partner, Lundin Norway AS, holds the remaining 35%

Production from Alvheim started in June 2008 (OGJ, June 16, 2008, Newsletter). Operator Marathon holds a 65% interest in the Alvheim field and the FPSO. Partners in Alvheim are ConocoPhillips Skandinavia AS 20% and Lundin Norway AS 15%.

Interest owners in Vilje are operator Statoil 28.85%, Marathon 46.9%, and Total E&P Norge AS 24.24%.

Talisman farms into Papua New Guinea permits

Talisman Energy Inc., Calgary, signed a $60 million deal with Horizon Oil Ltd., Sydney, to farm into Horizon's gas and condensate interests in the western province of Papua New Guinea.

Talisman will acquire 50% interest in retention lease PRL 4 that contains the Stanley gas-condensate discovery and a 50% interest in PRL 5 that contains the Elevala and Ketu gas discoveries.

Talisman paid $30 million in cash and an additional $8 million to be drawn down at any time and applied to Horizon's share of capital expenditure on the permits. The remaining $22 million will be drawn down after Papua New Guinea approves the working interest transfers.

Talisman's entry comes immediately after Horizon's recent announcement that it terminated its earlier $55 million deal with P3 Global Energy after P3 failed to make the required payments.

Horizon's short to medium-term plan for development of its Papua New Guinea assets involves production of 140 MMcfd of gas from two wells, and extraction from that gas of an initial 4,000 b/d of condensate, and potentially 40 tonnes/day of LPG before reinjecting the dry gas until a gas market develops in the region.

Horizon says the Stanley gas resource likely would be used for electric power generation to supply local domestic and industrial customers while the larger Elevala and Ketu gas resource would rely on export by pipeline or as a liquid via a small LNG facility.

The deal also adds to Talisman's recently acquired assets in western Papua New Guinea via its takeover of British company Rift Oil PLC earlier this year. Rift holds two permits, one of which contains the Puk Puk and Douglas gas discoveries. ✦

Processing — *Quick Takes*

Pemex refineries due low-sulfur fuel units

Pemex Refining let engineering, procurement, and construction (EPC) contracts worth $638 million to ICA Fluor for low-sulfur gasoline projects at two refineries in Mexico.

In addition to the EPC work, ICA Fluor will test and start up catalytic gasoline desulfurization plants, amine regeneration units, offsites, and utilities at the 275,000-b/cd refinery in Cadereyta, Nuevo Leon, and the 185,000-b/cd refinery in Ciudad Madero, Tamaulipas.

The Cadereyta project involves a 42,500-b/d catalytic distillation train. The Madero project involves two 20,000-b/d catalytic distillation plants.

ICA Fluor is a joint venture of Empresas ICA SAB de CV and Fluor Corp. Pemex Refining is a subsidiary of state-owned Petroleos Mexicanos.

Irving Oil to upgrade St. John refinery

Irving Oil will spend $220 million to upgrade its 250,000-b/d refinery at St. John, NB.

The privately held company said it will spend $170 million to upgrade the resid FCCU and a gasoline desulfurization unit.

When installed in 1998 with capacity of 70,000 b/d, the resid FCCU was the largest such unit in the world.

The refinery has another FCCU fed by vacuum gas oil. Total FCC capacity is 95,000 b/d (OGJ, Dec. 22, 2008, p. 48).

The refinery also has 35,000 b/d of catalytic reforming, 34,000 b/d of hydrocracking, and 92,000 b/d of hydrotreating capacity.

In addition to the FCCU and gasoline desulfurization work, the 60-day project will include general maintenance on other processing units to reduce flaring and fugitive emissions.

Agreement supports more Marcellus processing

A natural gas processing agreement announced Sept. 15 will underpin a new 120-MMcfd gas plant in the Marcellus shale gas play.

MarkWest Liberty Midstream & Resources LLC, a partnership between MarkWest Energy Partners LP and the Midstream & Resources Funds, announced it had reached agreement with Chesapeake Appalachia LLC, a subsidiary of Chesapeake Energy Corp., and Statoil Natural Gas LLC, a wholly owned subsidiary of StatoilHydro, to process gas at MarkWest Liberty's new Majorsville processing plant in the panhandle of West Virginia.

This agreement is in addition to one MarkWest Liberty executed earlier this year with Range Resources to process gas at the Majorsville plant. All agreements include "significant acreage dedications and other commitments," according to MarkWest's announcement. The Majorsville plant is to be completed in mid-2010.

With its infrastructure in Marshall and Wetzel counties in West Virginia, NiSource Gas Transmission & Storage's affiliate Columbia Gas Transmission will gather the rich gas produced by Chesapeake and Statoil. Per arrangements by MarkWest and Columbia announced in August 2008 (OGJ Online, Oct. 24, 2008), Columbia will deliver the gas to MarkWest's Majorsville processing plant, which is planned to be adjacent Columbia`s existing Majorsville compressor station.

NGLs produced at the Majorsville plant will move via pipeline to MarkWest's Houston, Pa., processing complex (OGJ Online, Apr. 9, 2009). MarkWest Liberty plans a 37,000-b/d fractionation plant at the Houston complex, as well as transportation, storage, and marketing infrastructure, to sell the NGLs into markets in the US Northeast.

The company currently operates a 22,000-b/d fractionation, storage, and marketing facility near Portsmouth, Ohio. ✦

Transportation — *Quick Takes*

Regency expands Haynesville takeaway capacity

Regency Energy Partners LP, Alinda Capital Partners LLC, and GE Energy Financial Services announced plans 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.

The lateral will add 12.5 miles of 36-in. pipe to the HEP, reaching further southwest to the west side of the Red River into Red River Parish, La. All the incremental capacity on the Red River Lateral has been contracted and 75,000 MMbtu/day of additional capacity on the Haynesville Expansion has been contracted as well. The expansion's 1.2 bcfd of capacity is fully subscribed with the exception of incremental space held back for operational flexibility.

Construction of the expansion project—including the Red River Lateral—is on schedule to meet a planned in-service date of Dec. 31, according to Regency. The 46 miles of 36-in. pipeline used is now being commissioned. Construction continues on 75 miles of 42-in. pipeline. Regency plans to begin construction of the Red River Lateral later this month.

The lateral will be funded by each of the partners of the RIGS joint venture in accordance with their ownership percentages. Regency has a 43% general partnership interest in the joint venture, while Alinda, and an affiliate of GE Energy Financial Services, have a 50% and a 7% general partnership interest, respectively. The companies formed the joint venture late first-quarter (OGJ Online, Apr. 1, 2009).

The expansions are underwritten by firm transportation agreements with 10-year terms, and roughly 85% of projected revenues will come from reservation fees.

China, Japan committed to PNG LNG project

Papua New Guinea's Public Enterprises Minister Arthur Somare completed a "positively satisfying and successful" visit to Japan and China in connection with the PNG LNG project.

"Asian governments contracting for long-term purchases of [LNG] wanted assurance that the PNG LNG project has the support of the PNG government," Somare told local media on his return.

"The Chinese and Japanese governments believe that the strong commitment of the PNG government is necessary to ensure smooth progress of the PNG LNG project," Somare said, adding that they are concerned about the role these imports would play in their respective economies over the next 30 years.

"We have been able to satisfy both governments on this score and to hold highly satisfactory meetings with prospective LNG customers that are in advanced sales negotiations with the project operator, ExxonMobil," Somare said.

Somare travelled to Japan and China as a special envoy of Prime Minister Michael Somare, accompanied by four members of Parliament Anthony Nene, Martin Aini, Jimmy Miringtoro, and Francis Potape.

In Beijing, the delegation held talks with Zhang Ping, who heads China's National Development Reform Commission, the supreme government body that sanctions all international business transactions conducted by China's state-owned corporations, including Sinopec.

Enterprise enters Eagle Ford shale agreement

Enterprise Products Partners LP entered into a long-term agreement to provide natural gas transportation and processing services on dedicated acreage owned by one of the largest and most active producers developing the Eagle Ford shale. The agreement covers more than 150,000 acres in the play.

Enterprise declined to name the producer but has publicly identified Anadarko Petroleum Corp., Petrohawk Energy Corp., ConocoPhillips, and Apache Corp., among others, as potential partners for its midstream services. Anadarko holds 350,000 acres in the Eagle Ford shale. Petrohawk's holdings in the play reached 210,000 acres in August. ConocoPhillips holds 300,000 acres, and Apache 400,000.

Stretching from the Mexico border along the Gulf Coast to near Louisiana, the Eagle Ford shale covers more than 10 million acres in Texas and lies beneath or near Enterprise's assets in the region. Enterprise said the proximity would require it make only modest capital expenditures to begin providing the transportation and processing services required under the agreement.

The bulk of the modifications to Enterprise's existing system would consist of filling gaps in its current gas gathering system, the company said. Enterprise would not comment regarding either the expected pipeline mileage required or the timeframe over which the work would be completed.

Enterprise completed expansion of two of its seven South Texas processing plants during first-quarter, increasing its processing capacity in the region to more than 1.5 bcfd, and said these expansions will largely address any capacity needs brought about by the new agreement. Enterprise increased capacity at the Shilling plant in Webb County, Tex., to 110 MMcfd from 60 MMcfd and expanded capacity at its Thompsonville natural gas processing plant in Jim Hogg County, Tex. to 330 MMcfd from 300 MMcfd (OGJ Newsletter, Mar. 23, 2009). ✦

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

SEPTEMBER

Annual Energy Policy Conference, Oklahoma City, (202) 580-6532, (202) 580-6559 (fax), e-mail: info@energyadvocates.org, website: www.energyadvocates.org. 20-22.

NPRA Environmental Conference, Denver, (202) 457-0480, (202) 457-0486 (fax), website: www.npra.org. 21-22.

Multiphase User Roundtable-Mexico, Villahermosa, (979) 268-8959, (979) 268-8718 (fax), e-mail: Heather@petroleumetc.com, website: www.mur-mexico.org. 22-23.

IADC Drilling HSE Europe Conference & Exhibition, Amsterdam, (713) 292-1945, (713) 292-1946 (fax), e-mail: conferences@iadc.org, website: www.iadc.org. 23-24.

SPE Eastern Regional Meeting, Charleston, W. Va., (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 23-25.

ERTC Sustainable Refining Conference, Brussels, 44 1737 365100, +44 1737 365101 (fax), e-mail: events@gtforum.com, website: www.gtforum.com. 28-30.

DGMK Production and Use of Light Olefins Conference, Dresden, 040 639004 0, 040 639004 50, website: www.dgmk.de. 28-30.

IADC Advanced Rig Technology Conference, Houston, (713) 292-1945, (713) 292-1946 (fax), e-mail: conferences@iadc.org, website: www.iadc.org. 29.

Unconventional Gas International Conference & Exhibition, Fort Worth, Tex., (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.unconventionalgas.net. Sept. 29-Oct. 1.

ERTC Biofuels+ Conference, Brussels, 44 1737 365100, +44 1737 365101 (fax), e-mail: events@gtforum.com, website: www.gtforum.com. Sept. 30-Oct. 2.

OCTOBER

Interstate Oil and Gas Compact Commission Annual Meeting (IOGCC), Biloxi, Miss., (405) 525-3556, (405) 525-3592 (fax), e-mail: iogcc@iogcc.state.ok.us, website: www.iogcc.state.ok.us. 4-6.

SPE Annual Technical Conference and Exhibition, New Orleans, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 4-7.

Canadian Offshore Resources Exhibition & Conference (CORE), Halifax, NS, (902) 425-4774, (902) 422-2332 (fax), e-mail: events@otans.com, website: www.otans.com. 5-8.

World Gas Conference, Buenos Aires, +54 11 5252 9801, e-mail: registration@wgc2009.com, website: www.wgc2009.com. 5-9.

ISA EXPO, Houston, (919) 549-8411, (919) 549-8288 (fax), e-mail: info@isa.org, website: www.isa.org. 6-8.

Kazakhstan International Oil & Gas Exhibition & Conference (KIOGE), Almaty, +44 (0) 207 596 5233, +44 (0) 207 596 5106 (fax), e-mail: oilgas@ite-exhibitions.com, website: www.oilgas-events.com. 6-9.

Power-Gen Asia Conference, Bangkok, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.powergenasia.com. 7-9.

Renewable Energy World Asia Conference & Expo, Bangkok, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.renewableenergyworld-asia.com. 7-9.

NPRA Q&A and Technology Forum, Ft. Worth, Tex., (202) 457-0480, (202) 457-0486 (fax), e-mail: info@npra.org, website: www.npra.org. 11-14.

API Fall Petroleum Measurement Standards Meeting, Calgary, Alta., (202) 682-8000, (202) 682-8222 (fax), website: www.api.org. 12-15.

GPA Houston Annual Meeting, Houston, (918) 493-3872, (918) 493-3875 (fax), e-mail: pmirkin@gpaglobal.org, website: www.gpaglobal.org. 13.

Expandable Technology Forum, Houston, +44 (0) 1483 598000, e-mail: sally.marriage@otmnet.com, website: www.expandableforum.com. 14-15.

International Oil & Gas Exploration, Production & Refining Exhibition, Jakarta, +44 (0)20 7840 2100, +44 (0)20 7840 2111 (fax), e-mail: ogti@oesallworld.com, website: www.allworldexhibitions.com. 14-17.

SPE/EAGE Reservoir Characterization and Simulation Conference and Exhibition, Abu Dhabi, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 18-21.

GSA Annual Meeting, Portland, (303) 357-1000, (303) 357-1070 (fax), e-mail: meetings@geosociety.org, website: www.geosociety.org. 18-21.

Oil Shale Symposium, Golden, Colo., (303) 384-2235, e-mail: jboak@mines.edu, website: www.mines.edu/outreach/cont_ed/oilshale/. 19-23.

Oil and Gas Transportation in the CIS and Caspain Region Annual Meeting, Moscow, +44 (0) 20 7067 1800, +44 (0) 20 7242 2673 (fax), website: www.theenergyexchange.co.uk. 20-22.

SEG International Exposition and Annual Meeting, Houston, (918) 497-5500, (918) 497-5557 (fax), e-mail: register@seg.org, website: www.seg.org. 25-30.

SPE/IADC Middle East Drilling Conference & Exhibition, Manama, +971 4 390 3540, +971 4 366 4648 (fax), e-mail: spedal@spe.org, website: www.spe.org. 26-28.

PICT-Passive Inflow Control Technology Meeting, Copenhagen, +44 (0) 1483-598000, e-mail: Dawn.Dukes@otmnet.com, website: www.inflowcontrol.com. 27-28.

Louisiana Gulf Coast Oil Exposition (LAGCOE), Lafayette, (337) 235-4055, (337) 237-1030 (fax), e-mail: lynette@lagcoe.com, website: www.lagcoe.com. 27-29.

North African Oil and Gas Summit, Tunis, +44 (0) 20 7067 1800, +44 (0) 20 7242 2673 (fax), website: www.theenergyexchange.co.uk. 27-29.

Offshore Middle East Conference & Exhibition, Manama, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.offshoremiddleeast.com. 27-29.

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

Calendar

(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, (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.

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.

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.

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

Emerging Unconventional Resources Conference & Exhibition, Shreveport, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.emergingresourcesconference.com. 8-10.

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.

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. 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.

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.

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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.

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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.

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NPRA International Petrochemical Conference, San Antonio, (202) 457-0480, (202) 457-0486 (fax), website: www.npra.org. 28-30.

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ATYRAU North Caspian Regional Oil, Gas and Infrastructure Exhibition, Atyrau, +44 (0) 207 596 5000, +44 (0) 207 596 5106 (fax), e-mail: oilgas@ite-exhibitions.com, website: www.oilgas-events.com. 6-8.

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AAPG Annual Convention and Exhibition, New Orleans, (918) 560-2679, (918) 560-2684 (fax), e-mail: convene@aapg.org, website: www.aapg.org 11-14.

IPAA OGIS, New York City, (202) 857-4722, (202) 857-4799 (fax), website: www.ipaa.org. 12-14.

SPE International Conference on Health, Safety and Environment in Oil and Gas Exploration and Production, Rio de Janeiro, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 12-14.

IADC Well Control Europe Conference & Exhibition, Aberdeen, (713) 292 1945, (713) 292 1946 (fax), e-mail: info@iadc.org, website: www.iadc.org. 13-14.

GPA Mid-continent Annual Meeting, Oklahoma City, (918) 493-3872, (918) 493-3875 (fax), e-mail: gpa@gasprocessors.com, website: www.gasprocessors.com. 15.

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.

Hannover Messe Pipeline Technology Trade Show, Hannover, +49 0 511 89 0, +49 0 511 89 32626 (fax), website: www.hannovermesse.de. 19-23.

API Pipeline Conference and Cybernetics Symposium, New Orleans, (202) 682-8000, (202) 682-8222 (fax), website: www.api.org. 20-22.

SPE Improved Oil Recovery Symposium, Tulsa, (918) 366-7033, (918) 366-7064 (fax), e-mail: IOR@SPEIOR.ORG, Website: www.speior.org. 26-28.

Middle East Fertilizer Symposium & 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. 26-28.

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Offshore Technology Conference (OTC), Houston, (972) 952-9494, (972) 952-9435 (fax), e-mail: service@otcnet.org, website: www.otcnet.org/2010. 3-6.

GPA Permian Basin Annual Meeting, Midland, Tex., (918) 493-3872, (918) 493-3875 (fax), website: www.gasprocessors.com. 4.

Asian Biofuels, New Feedstocks and Technology Roundtable, Singapore, +44 (0) 1242 529 090. +44 (0) 1242 529 060 (fax), e-mail: wra@theenergyexchange.co.uk, website: www.wraconferences.com. 4-6.

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Mediterranean Offshore Conference & Exhibition, Alexandria, Egypt, +20 2 27065210, +20 2 25184980 (fax), e-mail: conference@omc.it, website: www.moc2006.com. 18-20.

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	Current	Historical 1996–Current
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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

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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.
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From oasis to education

Laura Bell
Statistics Editor

Tucked in the woods of Osage County in northeastern Oklahoma was one man's hidden oasis. It was there that Frank Phillips, founder of Phillips Petroleum Co., established in 1925 a 3,700-acre wildlife preserve that was used as a family ranch retreat. The preserve, known as Woolaroc and now including a museum, is listed on the National Register of Historic Places. The name Woolaroc comes from the land: woods, lake, and rocks.

Currently Woolaroc is home to native wildlife such as buffalo, elk, and longhorn cattle as well as exotic birds and animals. The ranch includes a rustic lodge and the museum, which houses American artifacts and western art. The museum also holds one of the largest collections of Colt firearms in the world.

Phillips was a huge aviation enthusiast. In 1927 after Charles Lindbergh's famous flight over the Atlantic, Phillips sponsored a small, single-engine monoplane to fly from Oakland, Calif., to Honolulu. He named the plane Woolaroc, after his home retreat. When the plane was retired 2 years later, he brought the plane back to his ranch. He built a place to house the airplane, which now incorporates all of his collections in the museum.

The collections of art and American artifacts helped achieve his vision for the ranch: "preserving the history of the West that he knew as a young man."

Wildcatting days

Phillips moved to Oklahoma from Iowa in 1904, when the state was still Indian Territory. Phillips explored the Osage Hills, where the Sinclairs and the Gettys already had found oil. Phillips drilled several dry holes before making a discovery. Lot 185, near Woolaroc, would bring in about 1,000 b/d of oil. Phillips built a land position around Lot 185.

Needing more capital, Phillips looked to New York City. During many trips, he met investors as well as the woman who would become his wife and thought about moving his Bartlesville office to New York City. However, he wanted something more. He wanted something back home in Oklahoma. He respected the inhabitants of Indian Territory: the cowboys and Native Americans as well as the roughnecks and other wildcatters with whom he worked. Thus he established his estate in the land that gave him plenty.

The ranch was originally used to conduct business with stockholders and business associates. It gave visitors a way to escape the normal bustle of the business world in what has been described as "a romanticized wilderness sanctuary which he embellished with Wild West landscape images."

The lodge

Phillips hosted numerous gatherings at the lodge at Woolaroc, from intimate meetings to large parties, all oriented to business. In addition, Phillips hosted an annual picnic for the Phillips Petroleum employees. Visitors to Woolaroc included famous dignitaries, celebrities, and politicians as well as national figures Wiley Post and Will Rogers.

The most famous of the Phillips's picnics was the annual Cow Thieves and Outlaws event. As a thank-you to his Osage Hills neighbors, Phillips invited cowboys, known cow thieves, train robbers, and his local Osage Indian friends together for a day of barbeque. It was such a hit with the locals that it became an annual event.

In addition to the wild parties and business events, there were tales of famous poker games involving large stakes. Sometimes businesses, such as railroads, were getting handed over after a long night of gambling.

At the dedication of the Woolaroc Museum, Phillips said, "Those of us that have been more fortunate have a debt to society, which I believe can best be paid by training and educating the youth of the nation. I dedicate this museum to the boys and girls of today, the fathers and mothers of tomorrow. May they profit by a knowledge of man's past and be enabled to plan and live a happier future." ✦

Rig Photo: Courtesy Anadarko Petroleum Corp.

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Editorial

Doing-nothing fantasies

Among the myriad falsehoods that attach themselves to oil and gas in politics, one of the most persistent is also one that should be easy to see through. It's the idea that doing nothing makes money. And it's once again steering energy legislation toward costly senselessness.

Like most fantasies, this one has a tentative link with reality. At times, the Organization of Petroleum Exporting Countries does make money doing nothing—or at least doing less than everything possible. It sometimes elevates crude prices by not producing oil above certain rates. Success, though, is intermittent. Historically, price management has been difficult to implement and even harder to sustain.

Still, many people think OPEC consistently makes money by not producing crude. From there, analogy runs wild, and critical thought hides its head.

Loitering tankers

News stories after the Iranian Revolution of 1979, for example, gushed about tankers anchored off New York City, waiting for the price of crude to rise before discharging cargos. Prices were indeed rising because of the disruption to oil supply. So a reporter took a helicopter ride away from land and, sure enough, there they were: full tankers going nowhere. What else could they be up to except deliberately doing nothing (not selling oil) in order to make money (by profiting on future price increases)?

The question had less sinister answers, of course. The tankers were waiting on harbor pilots or berthing space in New York Harbor or responding to any of many other routine reasons for tankers not to steam into port from open sea without stopping. While they were at anchor, carrying costs and various daily fees mounted on cargos and ships, giving owners strong incentive to dock and unload promptly, whatever the price of crude.

But routine explanations make dull news. So a myth was born: In the oil industry, it's possible to make money at the expense of others by doing nothing. Persistence of the myth became evident last year, when news stories preposterously accused companies of closing refineries to limit oil supply and raise gasoline prices. Refineries that do nothing don't make money and never will.

With oil and gas, however, ungoverned suspicion suspends disbelief. Politicians thus have managed to persuade themselves and others recently that oil and gas operators need the federal government to prod them into action on leases on the Outer Continental Shelf. After discovering that drilling has not occurred on a large number of OCS leases, lawmakers concluded that companies delay the work to hold oil off the market and await, if not aggravate, price increases.

Like tankers at anchor near a port, leases with no drilling under way have routine explanations for the inactivity. Operators must secure permits before they can work on OCS acreage, which takes time. Environmental and other challenges create delays. Seismic and other surveys usually precede drilling. Operators often must wait on rigs. And they assemble leaseholdings according to their best guesses about how plays might develop, never planning to drill well on every lease or to make holes in the seabottom as fast as mechanics and logistics allow.

These are sound, routine reasons for a large number of OCS leases to be undrilled at any given time. And operators have incentive to keep that number as low as they can. They have bonus money tied up in leases and pay rentals until production starts. While they have good reasons to do nothing at certain times on certain leases, they surely don't make money that way.

Enforced diligence

Yet last week the House Committee on Natural Resources held hearings on legislation that would require the interior secretary to define and enforce "diligent development" of OCS leases. The measure would impose government judgment on decisions that rightly belong to companies risking money on leases.

Inevitably, the distortion to investment planning would discourage leasing and slow OCS development—in rich conflict with the bill's aims. And at the bottom of this pile of energy-policy rubble would lie the assumption, forever discredited yet apparently immortal, that doing nothing somehow makes money. ✦

OGJ150 group's profits, oil production slide in 2008

Marilyn Radler
Senior Editor-Economics

Laura Bell
Statistics Editor

The OGJ150 group of US oil and gas producers posted a sharp decline in 2008 earnings despite an increase in revenues. High demand for equipment, employees, and services led to a surge in capital and exploration expenditures and operating costs.

Earnings and production through the first half of 2008 were propelled by high commodity prices and strong worldwide demand growth. But the second half of 2008 saw oil and gas demand and prices thrown into rapid descent.

Worldwide demand for oil products slipped to average 85.4 million b/d in the fourth quarter of 2008, down from the year-earlier average of 87.8 million b/d, according to the International Energy Agency.

The OGJ150 group, previously the OGJ200 (OGJ, Sept. 15, 2008, p. 22), now contains only 141 companies. A year ago, there were 147 firms in the compilation.

Totaling $72 billion, the combined 2008 earnings of the firms in the group fell 32% from a year earlier, although revenues climbed 23% over the period. The group's oil production volumes moved lower from 2007, but gas production volumes were up.

To qualify for the OGJ150, oil and gas producers must have their headquarters in the US, be publicly traded, and hold oil or gas reserves in the US.

The total yearend 2008 assets of the 141 firms in the group were $1.077 trillion, and the companies' combined stockholders' equity was $488 billion. These were both little changed from a year earlier.

During 2008, the OGJ150 group's capital and exploratory expenditures totaled $162.8 billion, up from $123.7 billion a year earlier, as their number of US net wells drilled jumped 8%.

Changes to the group

There are five companies that are new to the group this year, while some firms dropped out and some are now listed with new names.

The highest-ranking company that appears in the report for the first time is Houston-based Mariner Energy Inc., ranked at No. 35 with $3.39 billion in

SOME KEY CHANGES FROM 2008 OGJ200

Table 1

How company appeared on last year's list	Why change?	How company appears on this year's list
Equitable Supply	Changed name to	EQT Production
DTE Oil & Gas Inc.	Changed name to	DTE Gas Resources
Energen Resources Corp.	Now listed as parent company	Energen Corp.

The following companies sold their US producing properties, liquidated, or became private since the last survey: Bayou City Exploration Inc., LL&E Royalty Trust

TOP 20 IN TOTAL REVENUE

Table 2

Rank	Company	Total revenue, $1,000
1	ExxonMobil Corp.	477,359,000
2	Chevron Corp.	273,005,000
3	ConocoPhillips	246,182,000
4	Marathon Oil Corp.	78,569,000
5	Hess Corp.	41,094,000
6	Murphy Oil Corp.	27,513,000
7	Occidental Petroleum Corp.	24,480,000
8	Anadarko Petroleum Corp.	15,723,000
9	Devon Energy Corp.	15,211,000
10	Apache Corp.	12,389,750
11	Chesapeake Energy Corp.	11,629,000
12	XTO Energy Inc.	7,695,000
13	EOG Resources Inc.	7,127,143
14	El Paso Corp.	5,363,000
15	Dominion Energy Inc.	4,312,000
16	Noble Energy Inc.	3,901,000
17	Questar Corp.	3,491,800
18	Williams Cos. Inc.	3,121,000
19	Plains Exploration & Production Co.	2,403,471
20	Pioneer Natural Resources Co.	2,338,287
	Total	**1,262,907,451**

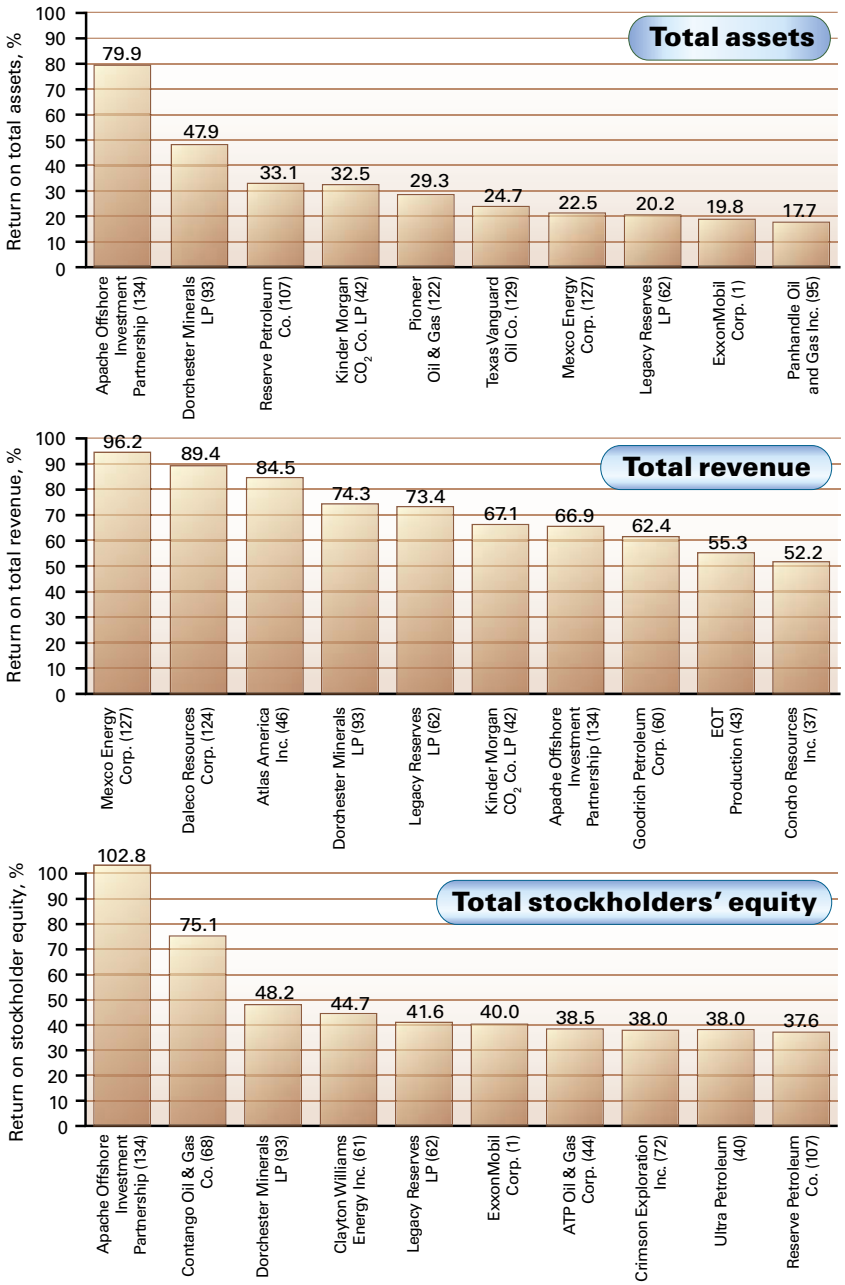
TOP 20 IN ASSETS—MARKET CAPITALIZATION[1]

Table 3

Rank	Company	Market capitalization, $1,000
1	ExxonMobil Corp.	397,234,080
2	Chevron Corp.	148,253,025
3	ConocoPhillips	78,783,555
4	Anadarko Petroleum Corp.	17,729,145
5	Marathon Oil Corp.	19,316,160
6	Occidental Petroleum Corp.	48,606,702
7	Chesapeake Energy Corp.	9,819,979
8	XTO Energy Inc.	20,440,080
9	Devon Energy Corp.	29,155,527
10	Apache Corp.	24,945,941
11	Hess Corp.	17,493,760
12	El Paso Corp.	5,469,782
13	EOG Resources Inc.	16,620,476
14	Noble Energy Inc.	8,515,060
15	Murphy Oil Corp.	8,458,157
16	Dominion Energy Inc.[2]	20,894,720
17	Williams Cos. Inc.[2]	8,369,440
18	Pioneer Natural Resources Co.	1,853,362
19	Questar Corp.	5,674,984
20	Newfield Exploration Co.	2,608,531
	Total	**890,242,465**

[1]As of Dec. 31, 2008. [2]Based on parent company data.

TOP COMPANIES IN RETURN ON...*



*Includes subsidiary companies, whose accounting methods vary and who may be helped by contributions from parent companies. Excludes companies whose results were inflated by identifiable extraordinary gains. Excludes royalty trusts. Excludes companies that get only a small portion of their revenue from oil and gas. Numbers in parentheses indicate rank by total assets.

assets at the end of 2008.

Since last year's report, Equitable Supply has changed its name and is now listed as EQT Production, and DTE Oil & Gas Inc. changed its name to DTE Gas Resources. Energen Resources Corp. is now listed as its parent company, Energen Corp.

Some companies that were listed in the compilation a year ago are no longer listed due to a variety of reasons. Bayou City Exploration Inc. sold its US producing properties. And LL&E Royalty Trust liquidated, so there are now only four royalty trusts in the group vs. five a year ago.

Galaxy Energy Corp. and Knight Energy Corp. filed bankruptcy and are not listed in the group this year. PRB Energy Inc. is not listed this year, as it is emerging from bankruptcy this year and has changed its name to Black Raven Energy Inc. And Infinity Energy Resources is not in the group this year because it had not filed its yearend report by presstime.

There are five limited partnerships in the OGJ150. The largest of these, with $2.34 billion in assets, is No. 42 Kinder Morgan CO_2 Co. LP. And the

20 FASTEST-GROWING COMPANIES[1]

Table 4

Rank by total assets	Company	Stockholders' equity 2008 $1,000	Stockholders' equity 2007 $1,000	Change, %	Net income 2008 $1,000	Net income 2007 $1,000	Change, %	Long-term debt 2008 $1,000	Long-term debt 2007 $1,000
8	XTO Energy Inc.	17,347,000	7,941,000	118.4	1,912,000	1,691,000	13.1	11,959,000	6,320,000
87	GeoResources Inc.	140,995	68,031	107.3	13,522	3,069	340.6	40,000	96,000
61	Clayton Williams Energy Inc.	314,682	160,806	95.7	140,534	5,990	2,246.1	347,225	430,175
69	Arena Resources Inc.	482,295	257,811	87.1	83,617	34,442	142.8	—	—
41	Berry Petroleum Co.	827,544	459,974	79.9	133,529	129,928	2.8	1,131,800	445,000
37	Concho Resources Inc.	1,325,154	775,398	70.9	278,702	25,360	999.0	630,000	325,404
32	Cabot Oil & Gas Corp.	1,790,562	1,070,257	67.3	211,290	167,423	26.2	831,143	330,000
27	Southwestern Energy Co.	2,507,830	1,646,500	52.3	567,946	221,174	156.8	674,200	977,600
45	Continental Resources Inc.	948,708	623,132	52.2	320,950	28,580	1,023.0	376,400	165,000
97	Credo Petroleum Corp.[2]	62,211	41,140	51.2	5,993	5,760	4.0	—	—
23	Range Resources Corp.	2,457,833	1,728,022	42.2	346,158	230,569	50.1	—	—
50	Bill Barrett Corp.	1,087,798	773,511	40.6	107,647	26,754	302.4	—	—
31	Energen Resources Corp.	1,913,290	1,378,658	38.8	321,915	309,233	4.1	207,557	208,467
33	Encore Acquisition Co.	1,314,128	948,155	38.6	430,812	17,155	2,411.3	1,319,811	1,120,236
129	Texas Vanguard Oil Co.	9,990	7,210	38.6	2,780	1,354	105.3	—	—
53	Comstock Resources Inc.	1,062,085	771,644	37.6	251,962	68,901	265.7	210,000	680,000
117	Spindletop Oil & Gas Co.	13,036	9,515	37.0	3,521	1,808	94.7	—	—
47	CNX Gas Corp.	1,384,874	1,023,237	35.3	239,073	135,678	76.2	15,386	5,799
19	Questar Corp.	3,418,000	2,577,900	32.6	683,800	507,400	34.8	2,078,900	1,021,200
14	Noble Energy Inc.	6,309,000	4,808,807	31.2	1,350,000	943,870	43.0	2,241,000	1,851,000

[1]Companies were selected on the basis of growth in stockholder's equity. Only companies with positive net income for both 2007 and 2008 were considered. Companies were not considered if they had a decline in net income for 2008, were subsidiaries of another company, or became public within the last year. [2]Year ending Oct. 31.

TOP 20 IN NET INCOME AND STOCKHOLDERS' EQUITY

Table 5

Rank	Company	Net income, $1,000
1	ExxonMobil Corp.	45,220,000
2	Chevron Corp.	23,931,000
3	Occidental Petroleum Corp.	6,857,000
4	Marathon Oil Corp.	3,528,000
5	Anadarko Petroleum Corp.	3,261,000
6	EOG Resources Inc.	2,436,919
7	Hess Corp.	2,360,000
8	XTO Energy Inc.	1,912,000
9	Murphy Oil Corp.	1,739,986
10	Noble Energy Inc.	1,350,000
11	Williams Cos. Inc.	1,260,000
12	Kinder Morgan CO_2 Co. LP	759,900
13	Chesapeake Energy Corp.	723,000
14	Apache Corp.	711,954
15	Questar Corp.	683,800
16	Southwestern Energy Co.	567,946
17	Dominion Energy Inc.	468,000
18	Encore Acquisition Co.	430,812
19	Ultra Petroleum	414,275
20	Denbury Resources Inc.	388,396
	Total	**99,003,988**

Rank	Company	Stockholders' equity, $1,000
1	ExxonMobil Corp.	112,965,000
2	Chevron Corp.	86,648,000
3	ConocoPhillips	55,165,000
4	Occidental Petroleum Corp.	27,300,000
5	Marathon Oil Corp.	21,409,000
6	Anadarko Petroleum Corp.	18,795,000
7	XTO Energy Inc.	17,347,000
8	Devon Energy Corp.	17,060,000
9	Apache Corp.	16,508,721
10	Chesapeake Energy Corp.	16,297,000
11	Hess Corp.	12,307,000
12	EOG Resources Inc.	9,014,497
13	Noble Energy Inc.	6,309,000
14	Murphy Oil Corp.	6,278,945
15	El Paso Corp.	4,035,000
16	Pioneer Natural Resources Co.	3,582,149
17	Questar Corp.	3,418,000
18	Petrohawk Energy Corp.	3,404,910
19	Newfield Exploration Co.	3,257,000
20	Southwestern Energy Co.	2,507,830
	Total	**443,609,052**

smallest of the limited partnerships is No. 134 Apache Offshore Investment Partnership with a total of $6.68 million in yearend 2008 assets.

Annual results

The companies in the OGJ150 logged increases in gas production volumes and yearend 2008 gas reserves, but oil production volumes declined from a year earlier, as did the group's combined oil reserves totals.

The OGJ150 details each company's liquids and gas production and reserves worldwide and breaks out such results for the US. The group's worldwide production of crude, condensate, and natural gas liquids declined nearly 10% from 2007, but in the US, the firms' collective liquids production dropped 17.5% last year.

During 2008, the group's worldwide capital spending soared 31.6%, as their US net wells drilled climbed to 25,113 from 23,279 a year earlier.

The Baker Hughes Inc. rotary rig count shows that the number of rigs drilling for oil and gas in the US during 2008 averaged more than during 2007, but by the end of 2008, the number was falling due to the drop in commodity prices amid the global economic slowdown.

Worldwide gas production volumes by the OGJ150 companies increased almost 8% last year, and their gas output in the US climbed 6%.

The group's reserves moved in tandem with their production volumes. Worldwide oil reserves held by the group were down 4% from the end of 2007, but the group's combined worldwide gas reserves increased 8%.

Financial performance

The two companies at the top of the OGJ150, ExxonMobil Corp. and Chev-

Top 20 in spending and US net wells drilled

Table 6

Rank	Company	Capital, exploratory spending, $1,000
1	ExxonMobil Corp.	20,769,000
2	Chevron Corp.	19,666,000
3	ConocoPhillips	19,099,000
4	Devon Energy Corp.	9,375,000
5	Chesapeake Energy Corp.	9,177,000
6	Marathon Oil Corp.	7,146,000
7	Apache Corp.	5,972,846
8	Anadarko Petroleum Corp.	4,801,000
9	EOG Resources Inc.	4,718,860
10	Occidental Petroleum Corp.	4,664,000
11	Hess Corp.	4,438,000
12	XTO Energy Inc.	3,661,000
13	Petrohawk Energy Corp.	3,121,736
14	El Paso Corp.	2,757,000
15	Questar Corp.	2,485,700
16	Forest Oil Corp.	2,338,488
17	Murphy Oil Corp.	2,185,960
18	Newfield Exploration Co.	2,067,000
19	Noble Energy Inc.	1,971,000
20	Southwestern Energy Co.	1,755,888
	Total	**132,170,478**

Rank	Company	US net wells drilled
1	Chesapeake Energy Corp.	1,733.0
2	Anadarko Petroleum Corp.	1,590.8
3	EOG Resources Inc.	1,545.0
4	XTO Energy Inc.	1,247.0
5	Devon Energy Corp.	1,068.9
6	Williams Cos. Inc.	1,050.0
7	Noble Energy Inc.	929.7
8	Chevron Corp.	860.0
9	ConocoPhillips	849.0
10	Occidental Petroleum Corp.	772.4
11	Pioneer Natural Resources Co.	566.0
12	CNX Gas Corp.	552.0
13	Equitable Supply	533.2
14	Range Resources Corp.	490.2
15	El Paso Corp.	450.0
16	ExxonMobil Corp.	442.0
17	Forest Oil Corp.	437.0
18	Quicksilver Resources Inc.	419.7
19	Atlas America Inc.	419.0
20	Exco Resources Inc.	399.5
	Total	**16,354.4**

Top 20 in liquids reserves

Table 7

Rank	Company	US liquids reserves, million bbl
1	ConocoPhillips	1,928.0
2	ExxonMobil Corp.	1,644.0
3	Occidental Petroleum Corp.	1,547.0
4	Chevron Corp.	1,470.0
5	Anadarko Petroleum Corp.	692.0
6	Apache Corp.	514.8
7	Devon Energy Corp.	484.0
8	Pioneer Natural Resources Co.	448.9
9	XTO Energy Inc.	343.3
10	Hess Corp.	227.0
11	EOG Resources Inc.	205.8
12	Noble Energy Inc.	198.0
13	Whiting Petroleum Corp.	180.0
14	Denbury Resources Inc.	179.1
15	Marathon Oil Corp.	178.0
16	Encore Acquisition Co.	134.5
17	Berry Petroleum Co.	125.3
18	Chesapeake Energy Corp.	120.6
19	Newfield Exploration Co.	110.8
20	Continental Resources Inc.	106.2
	Total	**10,837.3**

Rank	Company	Worldwide liquids reserves, million bbl
1	ExxonMobil Corp.	7,576.0
2	Chevron Corp.	7,305.0
3	ConocoPhillips	5,817.0
4	Occidental Petroleum Corp.	2,212.0
5	Apache Corp.	1,081.1
6	Hess Corp.	970.0
7	Anadarko Petroleum Corp.	926.0
8	Devon Energy Corp.	781.0
9	Marathon Oil Corp.	636.0
10	Pioneer Natural Resources Co.	463.0
11	XTO Energy Inc.	343.3
12	Noble Energy Inc.	311.0
13	EOG Resources Inc.	225.0
14	Whiting Petroleum Corp.	180.0
15	Denbury Resources Inc.	179.1
16	Murphy Oil Corp.	173.6
17	Newfield Exploration Co.	140.3
18	Encore Acquisition Co.	134.5
19	Berry Petroleum Co.	125.3
20	Chesapeake Energy Corp.	120.6
	Total	**29,699.8**

ron Corp., recorded improved earnings from 2007, but the group's combined net income declined sharply last year.

There were 65 companies in the group with a net loss for 2008, led by No. 3 ConocoPhillips. The Houston-based company took a $25.4 billion impairment on all its E&P segment goodwill and a $7.4 billion impairment on the book value of its OAO Lukoil investment. With these charges ConocoPhillips's net loss for the year was $17 billion.

Total revenue for the group of 141 companies was $1.31 trillion, up from $1.06 trillion a year earlier due to stronger average oil and gas prices.

For 2008, the average US wellhead price of crude oil was $94.04/bbl, up from $66.52/bbl a year earlier. The US Energy Information Administration estimates that the US wellhead price of gas last year climbed 27% on the previous year to average $8.07/Mcf.

Lower crack spreads and refining volumes in the US hit the downstream earnings of the integrated firms. US refinery utilization averaged 85.3% last year vs. 88.5% in 2007, according to EIA, whose figures show that capacity utilization has declined each year since it averaged 93% in 2004.

No. 5-ranked Marathon Oil Corp. reported that its refining, marketing, and transportation segment income for 2008 was down 43% from a year earlier to $1.179 billion on lower refining and wholesale marketing gross margins, and its manufacturing expenses were relatively higher in 2008 due primarily to higher energy costs and maintenance related activities.

The US Gulf Coast cash refining margin last year averaged $9/bbl, down from the 2007 average of $12.60/bbl, according to Muse, Stancil & Co. Meanwhile, the composite refiners' acquisition cost of crude in the US averaged $94.73/bbl last year, up from $67.94/bbl a year earlier.

Fastest growers

XTO Energy Inc. is the fastest grow-

TOP 20 IN LIQUIDS PRODUCTION

Table 8

Rank	Company	US liquids production, million bbl
1	ConocoPhillips	157.0
2	Chevron Corp.	154.0
3	ExxonMobil Corp.	104.0
4	Occidental Petroleum Corp.	96.0
5	Anadarko Petroleum Corp.	54.0
6	Devon Energy Corp.	41.0
7	Apache Corp.	35.1
8	XTO Energy Inc.	26.2
9	Marathon Oil Corp.	23.0
10	EOG Resources Inc.	20.0
11	Noble Energy Inc.	18.0
12	Pioneer Natural Resources Co.	15.1
13	Kinder Morgan CO_2 Co. LP	15.0
14	Hess Corp.	15.0
15	Whiting Petroleum Corp.	12.4
16	Denbury Resources Inc.	11.5
17	Chesapeake Energy Corp.	11.2
18	Encore Acquisition Co.	10.1
19	Continental Resources Inc.	9.1
20	Cimarex Energy Co.	8.4
	Total	**836.0**

Rank	Company	Worldwide liquids production, million bbl
1	ExxonMobil Corp.	724.0
2	Chevron Corp.	604.0
3	ConocoPhillips	494.0
4	Occidental Petroleum Corp.	171.0
5	Hess Corp.	97.0
6	Apache Corp.	96.9
7	Devon Energy Corp.	81.0
8	Anadarko Petroleum Corp.	80.0
9	Marathon Oil Corp.	77.0
10	Murphy Oil Corp.	38.7
11	Noble Energy Inc.	32.0
12	XTO Energy Inc.	26.2
13	EOG Resources Inc.	22.5
14	Pioneer Natural Resources Co.	18.2
15	Kinder Morgan CO_2 Co. LP	15.0
16	Whiting Petroleum Corp.	12.4
17	Denbury Resources Inc.	11.5
18	Chesapeake Energy Corp.	11.2
19	Newfield Exploration Co.	11.2
20	Encore Acquisition Co.	10.1
	Total	**2,633.9**

TOP 20 IN GAS PRODUCTION

Table 9

Rank	Company	US gas production, bcf
1	ConocoPhillips	896.0
2	Chesapeake Energy Corp.	775.4
3	Anadarko Petroleum Corp.	750.0
4	Devon Energy Corp.	726.0
5	XTO Energy Inc.	697.4
6	ExxonMobil Corp.	555.0
7	Chevron Corp.	549.0
8	EOG Resources Inc.	436.0
9	Williams Cos. Inc.	406.0
10	Apache Corp.	248.8
11	El Paso Corp.	230.0
12	Occidental Petroleum Corp.	215.0
13	Southwestern Energy Co.	192.3
14	Newfield Exploration Co.	167.9
15	Marathon Oil Corp.	164.0
16	Pioneer Natural Resources Co.	154.3
17	Questar Corp.	151.9
18	Noble Energy Inc.	145.0
19	Ultra Petroleum	138.6
20	Exco Resources Inc.	131.2
	Total	**7,729.7**

Rank	Company	Worldwide gas production, bcf
1	ExxonMobil Corp.	2,468.0
2	ConocoPhillips	2,095.0
3	Chevron Corp.	1,876.0
4	Devon Energy Corp.	940.0
5	Chesapeake Energy Corp.	775.4
6	Anadarko Petroleum Corp.	750.0
7	XTO Energy Inc.	697.4
8	EOG Resources Inc.	603.5
9	Apache Corp.	592.0
10	Williams Cos. Inc.	406.0
11	Marathon Oil Corp.	359.0
12	Occidental Petroleum Corp.	307.0
13	Noble Energy Inc.	281.0
14	Hess Corp.	272.0
15	El Paso Corp.	233.0
16	Southwestern Energy Co.	192.3
17	Newfield Exploration Co.	167.9
18	Pioneer Natural Resources Co.	158.9
19	Questar Corp.	151.9
20	Forest Oil Corp.	141.4
	Total	**13,467.8**

ing company of the OGJ150. With headquarters in Fort Worth, XTO Energy more than doubled its stockholders' equity during 2008 to $17.347 billion, while the company's earnings jumped 13% to $1.9 billion.

The list of the 20 fast growing companies ranks the firms by their growth in stockholders' equity. To qualify for this list, a company in the OGJ150 must have recorded positive net income for both 2008 and 2007 and shown an increase in net income last year. Excluded from this list of fast growers are limited partnerships, newly public companies, and subsidiaries.

GeoResources Inc. is the second-fastest growing company in the group, having grown its stockholders' equity 107% while boosting its 2008 earnings to $13.5 million from $3 million a year earlier.

The rest of the top 5 fastest growing firms in the group are Clayton Williams Energy Inc., Arena Resources Inc., and Berry Petroleum Co.

Arena Resources was also the fourth-fastest grower in last year's edition of this special report. Range Resources Corp., eleventh among the fast growers, and Spindletop Oil & Gas Co., seventeenth among the fast growers, also appeared on this list a year ago.

Top 20 firms

The highest-ranking firms in the OGJ150 as ranked by yearend 2008 assets fared a bit better than the entire group as far as earnings and output of oil and gas. These 20 companies that lead the list combined for a 25% decline in earnings last year, while their revenues were up almost 23%.

With growth of 28%, the total capital spending for this top 20 group was up less than that for the entire group. But their combined capital spending during 2008 was $127.3 billion, accounting for 78% of the outlays of all 141 companies in the compilation.

The number of US net wells drilled last year by the top 20 firms was 14,805, up nearly 12% from a year earlier. That number of wells accounts for

Top 20 in gas reserves

Table 10

Rank	Company	US gas reserves, bcf
1	XTO Energy Inc.	11,802.9
2	ExxonMobil Corp.	11,778.0
3	Chesapeake Energy Corp.	11,327.5
4	ConocoPhillips	10,920.0
5	Devon Energy Corp.	8,369.0
6	Anadarko Petroleum Corp.	8,150.0
7	EOG Resources Inc.	4,889.0
8	Williams Cos. Inc.	4,339.0
9	Ultra Petroleum	3,355.8
10	Occidental Petroleum Corp.	3,153.0
11	Chevron Corp.	3,150.0
12	Equitable Supply	3,097.3
13	Pioneer Natural Resources Co.	2,917.0
14	Apache Corp.	2,537.2
15	Range Resources Corp.	2,213.5
16	Southwestern Energy Co.	2,175.5
17	Newfield Exploration Co.	2,109.8
18	El Paso Corp.	2,091.0
19	Questar Corp.	2,028.5
20	Cabot Oil & Gas Corp.	1,886.0
	Total	**102,290.0**

Rank	Company	Worldwide gas reserves, bcf
1	ExxonMobil Corp.	31,402.0
2	ConocoPhillips	24,948.0
3	Chevron Corp.	23,075.0
4	XTO Energy Inc.	11,802.9
5	Chesapeake Energy Corp.	11,327.5
6	Devon Energy Corp.	9,885.0
7	Anadarko Petroleum Corp.	8,105.0
8	Apache Corp.	7,917.0
9	EOG Resources Inc.	7,339.2
10	Occidental Petroleum Corp.	4,601.0
11	Williams Cos. Inc.	4,339.0
12	Ultra Petroleum	3,355.8
13	Marathon Oil Corp.	3,351.0
14	Noble Energy Inc.	3,315.0
15	Equitable Supply	3,097.3
16	Pioneer Natural Resources Co.	2,979.8
17	Hess Corp.	2,773.0
18	Range Resources Corp.	2,213.5
19	Southwestern Energy Co.	2,175.5
20	El Paso Corp.	2,138.0
	Total	**170,140.5**

59% of the US net wells drilled by the entire OGJ150 group.

Also, with net income totaling $76.32 billion, the 2008 earnings of the top 20 firms exceeded the earnings of the entire group by $4 billion.

Only one company in the top 20 was not among these leaders last year. Questar Corp. is now ranked No. 19, up from No. 22. Based in Salt Lake City, Questar had yearend 2008 assets of $8.63 billion and $3.4 billion in stockholders' equity.

The market capitalization of the top 20 firms at the end of 2008 dropped sharply from a year earlier. As of Dec. 31, 2008, these companies' combined value of all shares outstanding totaled $890 billion. This compares to $1.26 trillion in market cap at yearend 2007 tallied by the top 20 companies in last year's compilation.

Earnings leaders

The OGJ150 also ranks the companies by their earnings. And the list of the top 20 earners during 2008 varies somewhat from the top 20 firms ranked by assets.

ExxonMobil leads both lists as ranked by assets and by 2008 earnings, posting net income of $45.22 billion last year. Chevron is second among the earnings leaders with $23.9 billion in 2008 net income, followed by Occidental Petroleum Corp., Marathon, and Anadarko Petroleum Corp.

The twelfth-leading earner in the OGJ150 is Kinder Morgan CO_2, which ranks at No. 42 in terms of assets. This Houston-based company's earnings last year were $759.9 million.

Top 20 in capex, drilling

ExxonMobil, Chevron, and ConocoPhillips were the top three companies in capital and exploratory spending last year, followed by Devon Energy Corp., Chesapeake Energy Corp., and Marathon.

Ranked at No. 22 by assets, Petrohawk Energy Corp. ranks at No. 13 in 2008 capital spending with outlays totaling $3.12 billion.

The top 20 capital spending leaders' collective outlays during the year totaled $132.17 billion. This compares with the previous top 20 group's 2007 capital spending of $103 billion.

With a count of 1,733 wells, Chesapeake Energy leads the OGJ150 group in the number of net wells drilled in the US during 2008. The company also led the group a year ago for its number of wells drilled in the US during 2007.

The large independent operators typically lead the list of the top 20 as ranked by their number of US net wells drilled. The second company on the list this year is Anadarko, with 1,590.8 wells, followed by EOG Resources, XTO Energy, and Devon Energy.

Production, reserves leaders

ExxonMobil leads the OGJ150 companies in worldwide liquids production and reserves, as well as in worldwide gas production and reserves.

ConocoPhillips leads the group in US liquids production, US liquids reserves, and US gas production but is ranked fourth in terms of US gas reserves. Topping the list of US gas reserves holders is XTO Energy.

In 2008, ConocoPhillips's production of crude, condensate, and NGL in the US totaled 157 million bbl. Chevron, which led the group a year ago with 2007 US liquids production of 168 million bbl, is now second, with 154 million bbl of liquids production.

Following ExxonMobil in worldwide liquids production are Chevron, ConocoPhillips, Occidental Petroleum, Hess Corp., and Apache Corp.

Similarly, the worldwide liquids reserves holders in the OGJ150 group that follow ExxonMobil are Chevron, ConocoPhillips, Occidental, Apache, and Hess.

Following ConocoPhillips in US gas production are Chesapeake, Anadarko, Devon, and XTO Energy. Sixth in US gas production for 2008 among the OGJ150 firms is ExxonMobil, followed by Chevron, EOG Resources, and Williams Cos. Inc. ✦

OGJ150

Rank by total assets 2008	Rank by total assets 2007	Company	Total assets $1,000	Total revenue Rank	Total revenue $1,000	Net income Rank	Net income $1,000	Stockholders' equity Rank	Stockholders' equity $1,000	Capital & expl. spending Rank	Capital & expl. spending $1,000
1	1	**ExxonMobil Corp.**	228,052,000	1	477,359,000	1	45,220,000	1	112,965,000	1	20,769,000
2	3	**Chevron Corp.**	161,165,000	2	273,005,000	2	23,931,000	2	86,648,000	2	19,666,000
3	2	**ConocoPhillips**	142,865,000	3	246,182,000	141	(16,998,000)	3	55,165,000	3	19,099,000
4	4	**Anadarko Petroleum Corp.**	48,923,000	8	15,723,000	5	3,261,000	6	18,795,000	8	4,801,000
5	5	**Marathon Oil Corp.**	42,686,000	4	78,569,000	4	3,528,000	5	21,409,000	6	7,146,000
6	7	**Occidental Petroleum Corp.**	41,537,000	7	24,480,000	3	6,857,000	4	27,300,000	10	4,664,000
7	8	**Chesapeake Energy Corp.**	38,444,000	11	11,629,000	13	723,000	10	16,297,000	5	9,177,000
8	12	**XTO Energy Inc.**	38,254,000	12	7,695,000	8	1,912,000	7	17,347,000	12	3,661,000
9	6	**Devon Energy Corp.**	31,908,000	9	15,211,000	140	(2,148,000)	8	17,060,000	4	9,375,000
10	9	**Apache Corp.**	29,186,485	10	12,389,750	14	711,954	9	16,508,721	7	5,972,846
11	10	**Hess Corp.**	28,589,000	5	41,094,000	7	2,360,000	11	12,307,000	11	4,438,000
12	11	**El Paso Corp.**	23,668,000	14	[1]5,363,000	135	(823,000)	15	4,035,000	14	2,757,000
13	13	**EOG Resources Inc.**	15,951,226	13	[2]7,127,143	6	2,436,919	12	9,014,497	9	4,718,860
14	14	**Noble Energy Inc.**	12,384,000	16	3,901,000	10	1,350,000	13	6,309,000	19	1,971,000
15	15	**Murphy Oil Corp.**	11,149,098	6	27,513,000	9	1,739,986	14	6,278,945	17	2,185,960
16	17	**Dominion Energy Inc.**[4]	11,100,000	15	4,312,000	17	468,000	—	NA	27	929,000
17	18	**Williams Cos. Inc.**[5]	10,286,000	18	3,121,000	11	1,260,000	—	NA	—	NA
18	19	**Pioneer Natural Resources Co.**	9,163,178	20	2,338,287	31	220,063	16	3,582,149	22	1,403,272
19	22	**Questar Corp.**	8,630,700	17	3,491,800	15	683,800	17	3,418,000	15	2,485,700
20	20	**Newfield Exploration Co.**	7,305,000	22	2,225,000	126	(373,000)	19	3,257,000	18	2,067,000
21	16	**Plains Exploration & Production Co.**	7,111,915	19	2,403,471	134	(709,094)	22	2,377,280	24	1,116,715
22	26	**Petrohawk Energy Corp.**	6,907,329	38	1,095,210	128	(388,052)	18	3,404,910	13	3,121,736
23	27	**Range Resources Corp.**	5,562,543	30	1,322,947	21	346,158	21	2,457,833	30	881,950
24	23	**Forest Oil Corp.**	5,282,798	25	1,647,163	137	(1,026,323)	28	1,672,912	16	2,338,488
25	24	**Helix Energy Solutions Group Inc.**	5,070,338	23	[7]2,148,349	133	(630,848)	35	1,170,645	31	855,530
26	21	**Exco Resources Inc.**	4,822,352	27	1,490,258	139	(1,733,471)	31	1,332,501	25	1,004,792
27	28	**Southwestern Energy Co.**	4,760,158	21	2,311,552	16	567,946	20	2,507,830	20	1,755,888
28	33	**Quicksilver Resources Inc.**	4,498,208	48	800,641	127	(373,622)	34	1,211,563	23	1,286,715
29	25	**Cimarex Energy Co.**	4,164,933	24	1,970,347	136	(901,685)	23	2,349,365	21	1,594,775
30	30	**Whiting Petroleum Corp.**	4,029,081	33	1,222,119	28	252,143	26	1,808,791	29	892,094
31	42	**Energen Corp.**[9]	3,775,404	26	[1]1,568,910	22	[1]321,915	24	1,913,290	48	460,237
32	40	**Cabot Oil & Gas Corp.**	3,701,664	43	[1]945,791	32	211,290	27	1,790,562	32	848,640
33	32	**Encore Acquisition Co.**	3,633,195	36	1,135,418	18	430,812	33	1,314,128	44	560,997
34	34	**Denbury Resources Inc.**	3,589,674	28	1,365,702	20	388,396	25	1,840,068	40	591,365
35	—	**Mariner Energy Inc.**	3,392,793	31	1,301,869	129	(388,713)	37	1,120,320	88	49,717
36	39	**Penn Virginia Corp.**	2,996,552	34	1,220,851	40	124,168	41	1,018,790	41	585,339
37	—	**Concho Resources Inc.**	2,815,203	55	533,789	24	278,702	32	1,325,154	54	347,702
38	35	**St. Mary Land & Exploration Co.**	2,695,016	32	1,301,786	46	91,553	36	1,127,485	35	745,617
39	41	**Unit Corp.**	2,581,866	29	1,358,093	35	143,625	29	1,633,099	34	782,434
40	47	**Ultra Petroleum**	2,558,162	39	1,084,818	19	414,275	38	1,090,786	26	949,650
41	49	**Berry Petroleum Co.**	2,542,383	47	801,531	39	133,529	43	827,544	51	392,769
42	43	**Kinder Morgan CO_2 Co. LP**	2,339,900	37	1,133,000	12	[10]759,900	—	NA	45	542,600
43	38	**EQT Production**	2,338,695	58	457,144	27	[1]252,784	—	NA	37	700,745
44	37	**ATP Oil & Gas Corp.**	2,275,610	51	621,505	42	121,705	56	316,349	28	917,523
45	51	**Continental Resources Inc.**	2,215,879	42	960,490	23	320,950	42	948,708	33	841,479
46	46	**Atlas America Inc.**[5]	2,189,931	61	311,850	25	263,656	—	NA	55	336,825
47	50	**CNX Gas Corp.**	2,124,973	49	789,421	30	239,073	30	1,384,874	46	524,663
48	45	**Stone Energy Corp.**	2,106,003	45	812,292	138	(1,137,231)	48	587,092	49	446,771
49	31	**W&T Offshore Inc.**	2,056,186	35	1,215,609	132	(558,819)	49	572,227	38	658,328
50	53	**Bill Barrett Corp.**	1,995,063	52	619,947	45	107,647	39	1,087,798	43	568,445
51	56	**Delta Petroleum Corp.**	1,895,414	62	281,310	131	(451,996)	44	747,457	47	510,917
52	55	**Fidelity Exploration & Production Co.**[12] [13]	1,792,792	50	[1]712,279	41	122,326	—	NA	36	711,000
53	36	**Comstock Resources Inc.**	1,577,890	53	591,846	29	251,962	40	1,062,085	50	418,730
54	44	**Swift Energy Co.**	1,517,288	44	820,815	124	(260,490)	47	600,877	39	628,325
55	54	**Seneca Resources Corp.**[13] [14]	1,416,120	57	466,760	34	146,612	—	NA	65	192,187
56	57	**Petroleum Development Corp.**	1,402,704	46	811,669	43	113,309	50	511,581	57	323,153
57	48	**McMoran Exploration Co.**	1,330,282	40	1,072,482	122	(216,694)	58	309,023	59	236,383
58	52	**Rosetta Resources Inc.**	1,154,378	56	500,947	120	(188,110)	45	726,372	60	228,464
59	63	**Carrizo Oil & Gas Inc.**	1,071,702	64	216,946	104	(45,047)	53	440,085	42	571,291
60	68	**Goodrich Petroleum Corp.**	1,038,946	63	218,235	38	136,238	46	650,646	52	362,847
61	58	**Clayton Williams Energy Inc.**	943,409	54	565,517	37	140,534	57	314,682	53	350,106
62	72	**Legacy Reserves LP**	783,072	65	215,517	33	158,207	54	380,633	62	216,390

Worldwide 2008 liquids — production — Rank	Mill bbl	Worldwide 2008 natural gas — production — Rank	Bcf	Worldwide 2008 liquids — reserves — Rank	Mill bbl	Worldwide 2008 natural gas — reserves — Rank	Bcf	US 2008 liquids — production — Rank	Mill bbl	US 2008 natural gas — production — Rank	Bcf	US 2008 liquids — reserves — Rank	Mill bbl	US 2008 natural gas — reserves — Rank	Bcf	US 2008 net wells — drilled — Rank	Wells
1	724.0	1	2,468.0	1	7,576.0	1	31,402.0	3	104.0	6	555.0	2	1,644.0	2	11,778.0	16	442.0
2	604.0	3	1,876.0	2	7,305.0	3	23,075.0	2	154.0	7	549.0	4	1,470.0	11	3,150.0	8	860.0
3	494.0	2	2,095.0	3	5,817.0	2	24,948.0	1	157.0	1	896.0	1	1,928.0	4	10,920.0	9	849.0
8	80.00	6	750.0	7	926.0	7	8,105.0	5	54.00	3	750.0	5	692.0	6	8,150.0	2	1,590.8
9	77.00	11	359.0	9	636.0	13	3,351.0	9	23.00	15	164.0	15	178.0	28	1,085.0	35	246.0
4	171.0	12	307.0	4	2,212.0	10	4,601.0	4	96.00	12	215.0	3	1,547.0	10	3,153.0	10	772.4
18	11.22	5	775.4	20	120.6	5	11,327.5	17	11.22	2	775.4	18	120.6	3	11,327.5	1	1,733.0
12	26.20	7	697.4	11	343.3	4	11,802.9	8	26.20	5	697.4	9	343.3	1	11,802.9	4	1,247.0
7	81.00	4	940.0	8	781.0	6	9,885.0	6	41.00	4	726.0	7	484.0	5	8,369.0	5	1,068.9
6	96.92	9	592.0	5	1,081.1	8	7,917.0	7	35.06	10	248.8	6	514.8	14	2,537.2	24	371.2
5	97.00	14	272.0	6	970.0	17	2,773.0	14	15.00	43	34.00	10	227.0	55	276.0	65	53.00
28	6.496	15	233.0	41	31.25	20	2,138.0	28	6.372	11	230.0	40	28.07	18	2,091.0	15	450.0
13	22.50	8	603.5	13	225.0	9	7,339.2	10	19.97	8	436.0	11	205.8	7	4,889.0	3	[3]1,545
11	32.00	13	281.0	12	311.0	14	3,315.0	11	18.00	18	145.0	12	198.0	21	1,859.0	7	929.7
10	38.70	54	23.00	16	173.6	39	585.6	35	3.900	59	17.80	43	26.80	69	97.40	99	4.000
58	0.919	36	59.00	56	12.43	29	1,099.0	58	0.919	34	59.00	56	12.43	27	1,099.0	21	386.0
—	NA	10	406.0	—	NA	11	4,339.0	—	NA	9	406.0	—	NA	8	4,339.0	6	1,050.0
14	18.19	18	158.9	10	463.0	16	2,979.8	12	15.05	16	154.3	8	448.9	13	2,917.0	11	566.0
37	3.300	19	151.9	40	31.60	22	2,028.5	37	3.300	17	151.9	39	31.60	19	2,028.5	33	267.2
19	11.20	17	167.9	17	140.3	21	2,109.8	22	7.000	14	167.9	19	110.8	17	2,109.8	23	374.0
118	0.020	125	0.079	121	0.178	129	0.686	117	0.020	124	0.079	120	0.178	128	0.686	38	195.6
48	1.554	25	102.3	54	13.84	28	1,334.7	48	1.554	24	102.3	54	13.84	25	1,334.7	32	267.4
34	4.471	24	114.3	27	73.34	18	2,213.5	33	4.471	23	114.3	26	73.34	15	2,213.5	14	490.2
23	8.031	20	141.4	21	109.1	23	2,013.4	24	6.929	22	118.1	21	100.3	23	1,719.6	17	437.0
41	2.751	41	[8]42.46	39	32.01	44	[8]439.0	41	2.751	40	[8]42.16	38	32.01	44	[8]424.7	102	3.400
43	2.236	22	131.2	48	20.80	25	1,815.1	43	2.236	20	131.2	48	20.80	22	1,815.1	20	399.5
75	0.385	16	192.3	94	1.507	19	2,175.5	75	0.385	13	192.3	94	1.507	16	2,175.5	29	301.4
32	4.679	32	68.13	23	94.85	26	1,639.1	31	4.677	39	45.06	22	94.84	26	1,306.5	18	419.7
22	8.395	23	127.4	34	44.52	32	834.5	20	8.395	21	127.4	32	44.52	31	834.5	31	276.9
16	12.45	48	30.42	14	180.0	50	354.8	15	12.45	47	30.42	13	180.0	48	354.8	45	125.7
30	5.797	34	67.57	24	90.99	30	1,038.5	29	5.797	32	67.57	23	90.99	29	1,038.5	37	203.6
63	0.794	26	90.43	61	9.341	24	1,886.0	63	0.794	25	90.43	61	9.341	20	1,886.0	25	351.2
20	10.05	50	26.37	18	134.5	53	307.5	18	10.05	49	26.37	16	134.5	50	307.5	49	112.0
17	11.51	45	32.74	15	179.1	46	428.0	16	11.51	45	32.74	14	179.1	43	428.0	52	100.0
29	6.439	28	79.76	28	69.30	40	558.0	27	6.439	27	79.76	27	69.30	38	558.0	51	102.5
60	0.898	42	41.49	43	26.97	35	754.1	60	0.898	41	41.49	42	26.97	34	754.1	40	179.6
33	4.586	63	14.97	25	86.29	54	305.9	32	4.586	63	14.97	24	86.29	51	305.9	43	141.0
27	6.615	30	74.91	32	51.36	41	557.4	26	6.615	29	74.91	30	51.36	39	557.4	28	304.3
42	2.649	40	47.47	50	19.87	43	450.1	42	2.649	38	47.47	50	19.87	41	450.1	44	134.3
51	1.122	21	138.6	42	27.01	12	3,355.8	51	1.122	19	138.6	41	27.01	9	3,355.8	47	121.5
24	7.440	51	25.56	19	125.3	36	724.1	21	7.440	50	25.56	17	125.3	35	724.1	22	381.0
15	15.00	108	0.499	26	85.44	120	1.274	13	15.00	108	0.499	25	85.44	119	1.274	100	4.000
96	0.104	27	89.96	88	2.125	15	3,097.3	95	0.104	26	89.96	88	2.125	12	3,097.3	13	533.2
35	4.267	46	31.86	30	65.31	51	321.7	34	4.232	61	16.76	34	39.81	59	210.8	95	5.900
21	9.147	61	17.15	22	106.2	52	318.1	19	9.147	60	17.15	20	106.2	49	318.1	41	152.5
89	0.159	44	33.90	91	1.734	31	990.8	89	0.159	44	33.90	91	1.734	30	990.8	19	419.0
—	—	29	[11]76.56	—	—	27	[11]1,422.0	—	—	28	[11]76.56	—	—	24	[11]1,422.0	12	552.0
31	4.916	43	34.41	37	36.56	55	299.6	30	4.916	42	34.41	36	36.56	52	299.6	77	14.91
25	6.970	37	56.07	35	43.88	59	227.9	23	6.970	35	56.07	33	43.88	57	227.9	75	18.40
69	0.661	31	73.62	74	5.662	34	784.3	69	0.661	30	73.62	74	5.662	33	784.3	39	188.6
56	0.993	59	18.95	59	9.453	33	827.7	56	0.993	57	18.95	59	9.453	32	827.7	50	103.5
40	2.808	35	65.46	38	34.35	38	604.3	40	2.808	33	65.46	37	34.35	37	604.3	30	290.0
55	1.009	38	53.87	58	9.668	42	523.6	55	1.009	36	53.87	58	9.668	40	523.6	53	89.70
26	6.741	56	22.34	29	67.71	56	292.4	25	6.632	55	20.50	28	67.71	53	292.4	46	121.8
39	3.070	55	22.34	33	46.20	60	225.9	39	3.070	53	22.34	31	46.20	58	225.9	34	260.5
49	1.160	47	31.76	53	15.04	37	662.9	49	1.160	46	31.76	53	15.04	36	662.9	27	333.4
36	3.633	33	67.89	52	16.99	58	242.9	36	3.633	31	67.89	52	16.99	56	242.9	92	6.374
59	0.908	39	48.00	80	3.603	49	376.0	59	0.908	37	48.00	80	3.603	47	376.0	42	151.5
76	0.347	52	23.55	51	18.31	47	392.7	76	0.347	51	23.55	51	18.31	45	392.7	55	87.60
87	0.174	53	23.19	89	1.983	48	390.4	87	0.174	52	23.19	89	1.983	46	390.4	57	75.40
38	3.134	60	18.55	49	20.78	69	103.9	38	3.134	58	18.55	49	20.78	68	103.9	58	72.40
46	1.969	84	4.838	47	20.93	82	59.28	46	1.969	84	4.838	47	20.93	82	59.28	—	—

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Rank by total assets 2008	Rank by total assets 2007	Company	Total assets $1,000	Total revenue Rank	Total revenue $1,000	Net income Rank	Net income $1,000	Stockholders' equity Rank	Stockholders' equity $1,000	Capital & expl. spending Rank	Capital & expl. spending $1,000
63	59	**Energy Partners Ltd.**	766,766	59	357,036	106	(52,212)	82	57,119	64	199,157
64	64	**Layne Christensen Co.**[15]	719,357	41	1,008,063	53	26,534	52	456,022	81	77,941
65	66	**PetroQuest Energy Inc.**	670,249	60	314,302	113	(96,960)	60	237,487	56	325,936
66	62	**Belden & Blake Corp.**	669,464	72	158,426	103	(28,944)	75	76,551	92	30,594
67	65	**Quest Resource Corp.**[16]	650,176	69	176,349	118	(167,384)	125	(3,882)	71	141,553
68	90	**Contango Oil & Gas Co.**[17]	599,974	81	118,467	26	256,906	55	341,998	74	119,929
69	80	**Arena Resources Inc.**	591,685	66	210,159	49	83,617	51	482,295	63	207,023
70	77	**GMX Resources Inc.**	577,852	80	[18]125,736	112	(81,713)	59	277,417	58	322,934
71	69	**Parallel Petroleum Corp.**	550,576	68	182,793	115	(131,894)	71	107,046	61	217,393
72	76	**Crimson Exploration Inc.**	511,546	67	[1]186,768	51	46,203	67	121,623	70	141,795
73	70	**Brigham Exploration Co.**	489,056	79	127,979	117	(162,247)	68	121,269	67	178,637
74	79	**TXCO Resources Inc.**	486,850	76	143,923	61	5,882	63	155,729	66	181,565
75	74	**Black Hills Corp.**[5]	403,583	84	[1]106,347	110	[1](71,188)	—	NA	78	89,169
76	67	**Dune Energy Inc.**	402,052	74	147,101	116	(141,120)	130	(177,075)	86	52,750
77	61	**Edge Petroleum Corp.**	357,597	71	158,777	125	(332,890)	73	97,488	83	60,157
78	84	**Approach Resources Inc.**	338,241	90	79,869	54	23,386	62	223,813	77	100,089
79	78	**DTE Gas Resources**[19]	314,000	95	[1]48,000	48	84,000	—	NA	76	101,000
80	71	**Meridian Resource Corp.**	304,575	73	149,165	121	(209,886)	66	122,511	73	124,059
81	82	**Rex Energy Corp.**	302,006	92	68,297	105	(48,682)	61	231,848	80	81,712
82	73	**Warren Resources Inc.**	286,633	83	109,152	123	(241,557)	70	112,025	75	111,627
83	87	**Cano Petroleum Inc.**[17]	277,808	96	44,663	99	(17,521)	74	83,850	79	87,751
84	81	**PrimeEnergy Corp.**	267,830	70	169,719	73	541	84	49,288	85	55,515
85	60	**Callon Petroleum Co.**	266,090	78	[1]141,312	130	(438,893)	129	(129,804)	68	176,536
86	86	**NGAS Resources Inc.**	247,354	89	84,502	66	2,936	72	104,567	84	56,349
87	85	**GeoResources Inc.**	243,534	86	94,606	57	13,522	64	140,995	87	51,824
88	75	**Gulfport Energy Corp.**	221,873	77	141,757	119	(184,502)	69	114,101	72	126,030
89	91	**Abraxas Petroleum Corp.**	211,839	85	100,497	107	(52,403)	115	4,658	69	174,586
90	95	**Double Eagle Petroleum Co.**[21]	171,989	94	49,578	58	10,381	83	54,903	89	44,378
91	83	**Aurora Oil & Gas Corp.**	160,201	99	29,841	114	(107,287)	90	27,155	101	10,470
92	92	**Gasco Energy Inc.**	153,886	97	41,885	56	14,514	85	44,043	90	44,250
93	89	**Dorchester Minerals LP**	139,562	88	[1]89,925	50	66,783	65	[22]138,582	130	50
94	98	**Teton Energy Corp.**	126,858	100	28,810	97	(14,173)	79	61,271	82	76,945
95	97	**Panhandle Oil and Gas Inc.**[13]	122,007	91	69,119	55	21,556	76	68,349	91	38,748
96	88	**Platinum Energy Resources Inc.**	104,877	93	53,382	111	(80,820)	80	60,184	94	20,663
97	100	**Credo Petroleum Corp.**[23]	80,560	106	[1]17,345	60	5,993	78	62,211	104	9,544
98	93	**HKN Inc.**	68,773	103	19,523	102	(26,746)	81	59,904	109	6,896
99	94	**American Oil & Gas Inc.**	67,389	127	2,895	101	(23,532)	77	62,568	95	20,612
100	99	**Petro Resources Corp.**	61,665	132	1,607	95	(6,886)	87	33,693	97	16,223
101	104	**FX Energy Inc.**	54,802	105	17,841	108	(54,704)	99	15,154	93	21,808
102	105	**GeoPetro Resources Co.**	54,076	119	6,244	79	(175)	86	43,823	111	5,569
103	109	**Tengasco Inc.**[24]	42,447	108	15,601	78	(170)	89	28,576	127	189
104	96	**Foothills Resources Inc.**	41,100	109	14,451	109	(59,257)	127	(39,034)	96	18,638
105	108	**Evolution Petroleum Corp.**[17]	40,366	121	5,111	84	(1,571)	88	33,004	100	11,187
106	120	**Cubic Energy Inc.**[17]	29,491	129	2,302	93	(5,128)	113	5,858	98	15,342
107	115	**Reserve Petroleum Co.**	29,155	102	20,706	59	9,648	91	25,637	112	5,163
108	101	**New Century Energy Corp.**	25,590	101	24,355	100	(20,543)	128	(43,405)	117	2,979
109	111	**San Juan Basin Royalty Trust**	25,377	75	144,588	36	143,081	95	17,927	—	—
110	110	**Royale Energy Inc.**	24,191	104	19,174	96	(8,778)	109	7,394	102	9,865
111	119	**EnDevCo Inc.**	23,224	124	3,295	91	(4,129)	126	(5,804)	110	5,847
112	103	**PetroSearch Energy Corp.**	22,713	133	1,580	75	412	92	21,269	108	6,932
113	117	**Houston American Energy Corp.**	22,637	111	10,917	74	465	93	21,048	—	—
114	121	**Pegasi Energy Resources Corp.**	22,504	128	2,675	82	(685)	98	15,702	113	4,687
115	131	**Lucas Energy Inc.**[24]	22,316	125	3,216	76	23	94	20,165	103	9,749
116	113	**Adams Resources & Energy Inc.**[5]	21,904	107	[1]17,248	90	[1](3,348)	—	NA	99	12,038
117	123	**Spindletop Oil & Gas Co.**	21,289	110	14,064	64	3,521	101	13,036	118	2,527
118	124	**Basic Earth Science Systems Inc.**[24]	20,690	116	7,599	68	1,763	102	11,984	125	587
119	116	**Aspen Exploration Corp.**[17]	20,001	120	5,508	71	803	103	11,702	114	3,663
120	118	**Cross Timbers Royalty Trust**	18,771	98	31,332	52	[25]30,942	96	[26]17,256	—	NA
121	114	**Tri-Valley Corp.**	17,471	114	8,125	98	(14,209)	111	6,816	106	7,307
122	128	**Pioneer Oil & Gas**[13]	16,967	112	10,159	63	4,966	97	15,991	—	—
123	126	**Index Oil and Gas Inc.**[24]	16,178	130	1,911	85	(1,946)	100	15,064	—	—
124	122	**Daleco Resources Corp.**[13]	16,137	134	1,241	70	1,110	108	7,855	—	—

Worldwide 2008 liquids — production — Rank	Mill bbl	Worldwide 2008 natural gas — production — Rank	Bcf	Worldwide 2008 liquids — reserves — Rank	Mill bbl	Worldwide 2008 natural gas — reserves — Rank	Bcf	US 2008 liquids — production — Rank	Mill bbl	US 2008 natural gas — production — Rank	Bcf	US 2008 liquids — reserves — Rank	Mill bbl	US 2008 natural gas — reserves — Rank	Bcf	US 2008 net wells — drilled — Rank	Wells
44	2.052	62	16.50	45	21.64	73	90.81	44	2.052	62	16.50	45	21.64	73	90.81	83	11.50
—	—	81	5.132	—	—	101	16.56	—	—	81	5.132	—	—	100	16.56	48	116.0
68	0.681	49	29.71	87	2.201	63	172.2	68	0.681	48	29.71	87	2.201	62	172.2	69	40.04
77	0.334	64	13.22	79	3.833	61	199.8	77	0.334	64	13.22	79	3.833	60	199.8	54	88.40
99	0.070	57	21.33	105	0.695	64	170.6	98	0.070	54	21.33	105	0.695	63	170.6	26	340.0
79	0.299	70	10.59	55	12.92	57	291.6	79	0.299	70	10.59	55	12.92	54	291.6	88	9.100
45	2.018	92	1.912	31	55.85	83	58.81	45	2.018	92	1.912	29	55.85	83	58.81	36	233.0
85	0.190	67	11.78	77	5.004	45	435.3	85	0.190	67	11.78	77	5.004	42	435.3	63	60.20
52	1.027	68	10.94	46	21.21	78	71.83	52	1.027	68	10.94	46	21.21	78	71.83	66	48.51
53	1.014	65	13.14	70	5.963	71	96.17	53	1.014	65	13.14	70	5.963	71	96.17	81	12.59
71	0.578	74	7.996	65	7.065	72	94.68	71	0.578	74	7.996	65	7.065	72	94.68	84	11.40
50	1.132	91	2.422	64	7.628	89	35.98	50	1.132	91	2.422	64	7.628	89	35.98	67	44.92
73	0.387	69	10.70	76	5.185	67	154.4	73	0.387	69	10.70	76	5.185	66	154.4	72	31.38
61	0.890	75	7.441	63	8.199	76	83.81	61	0.890	75	7.441	63	8.199	76	83.81	90	7.900
62	0.853	66	12.06	73	5.752	74	89.62	62	0.853	66	12.06	73	5.752	74	89.62	85	9.950
82	0.277	76	7.092	67	6.367	62	172.9	82	0.277	76	7.092	67	6.367	61	172.9	61	62.50
—	—	82	[6]5.000	—	—	65	[6]167.0	—	—	82	[6]5.000	—	—	64	[6]167.0	—	NA
65	0.765	71	9.369	78	4.903	86	50.90	65	0.765	71	9.369	78	4.903	86	50.90	78	14.00
64	0.776	100	1.037	69	5.994	92	30.02	64	0.776	100	1.037	69	5.994	92	30.02	62	61.10
54	1.011	89	2.930	60	9.414	77	72.83	54	1.011	89	2.930	60	9.414	77	72.83	64	58.80
80	0.297	96	1.345	36	39.12	75	84.44	80	0.297	96	1.345	35	39.12	75	84.44	59	[20]68.00
70	0.658	72	8.899	75	5.317	84	55.34	70	0.658	72	8.899	75	5.317	84	55.34	68	41.68
57	0.942	80	5.840	68	6.027	99	18.65	57	0.942	80	5.840	68	6.027	98	18.65	—	—
91	0.150	87	3.088	83	2.798	80	61.13	91	0.150	87	3.088	83	2.798	80	61.13	56	83.39
67	0.743	88	2.962	62	8.793	90	34.80	67	0.743	88	2.962	62	8.793	90	34.80	80	12.77
47	1.645	103	0.712	44	21.77	95	22.24	47	1.645	103	0.712	44	21.77	95	22.24	73	28.00
72	0.550	79	6.343	66	7.045	68	108.4	72	0.550	79	6.343	66	7.045	67	108.4	86	9.400
115	0.025	78	6.530	113	0.296	79	63.01	115	0.025	78	6.530	113	0.296	79	63.01	71	36.42
117	0.025	90	2.894	122	0.115	70	97.36	114	0.025	90	2.894	121	0.115	70	97.36	93	6.130
107	0.043	85	4.583	111	0.361	85	50.91	106	0.043	85	4.583	111	0.361	85	50.91	97	5.300
78	0.313	73	8.348	81	3.570	81	60.98	78	0.313	73	8.348	81	3.570	81	60.98	—	NA
84	0.192	94	1.658	92	1.558	100	16.88	84	0.192	94	1.658	92	1.558	99	16.88	70	39.70
93	0.132	77	6.928	101	0.990	87	48.15	93	0.132	77	6.928	101	0.990	87	48.15	87	9.247
81	0.281	101	0.811	85	2.310	102	16.04	81	0.281	101	0.811	85	2.310	101	16.04	74	18.90
102	0.056	95	1.545	104	0.710	103	15.53	101	0.056	95	1.545	104	0.710	102	15.53	91	6.581
92	0.149	104	0.703	95	1.459	110	4.215	92	0.149	104	0.703	95	1.459	109	4.215	116	0.390
116	0.025	116	0.136	125	0.087	121	1.147	116	0.025	115	0.136	124	0.087	120	1.147	104	2.580
90	0.152	114	0.341	84	2.409	109	4.253	90	0.152	113	0.341	84	2.409	108	4.253	89	8.510
98	0.085	110	0.461	107	0.584	98	19.26	97	0.076	—	—	110	0.382	—	—	101	3.500
—	—	99	1.116	—	—	97	20.47	—	—	99	1.116	—	—	97	20.47	113	1.150
88	0.162	122	0.104	97	1.248	125	0.910	88	0.162	121	0.104	97	1.248	124	0.910	82	[20]12.00
86	0.183	124	0.079	82	2.804	126	0.777	86	0.183	123	0.079	82	2.804	125	0.777	—	—
108	0.040	126	0.069	86	2.263	105	10.53	107	0.040	125	0.069	86	2.263	104	10.53	—	—
131	0.002	115	0.228	124	0.089	108	6.090	130	0.002	114	0.228	123	0.089	107	6.090	96	5.880
100	0.066	111	0.396	114	0.267	119	1.555	99	0.066	110	0.396	114	0.267	118	1.555	98	4.030
83	0.202	107	0.500	98	1.140	117	1.877	83	0.202	107	0.500	98	1.140	116	1.877	76	15.00
113	0.028	58	19.53	116	0.249	66	156.3	111	0.028	56	19.53	116	0.249	65	156.3	—	NA
121	0.011	102	0.714	129	0.025	111	3.377	120	0.011	102	0.714	128	0.025	110	3.377	105	2.560
112	0.028	133	0.037	57	10.46	91	32.01	112	0.028	132	0.037	57	10.46	91	32.01	—	—
128	0.004	120	0.116	93	1.535	127	0.766	127	0.004	119	0.116	93	1.535	126	0.766	108	2.000
95	0.124	136	0.025	119	0.213	139	0.019	132	0.002	135	0.025	133	0.002	138	0.019	110	1.975
124	0.008	128	0.063	100	1.048	93	27.37	123	0.008	127	0.063	100	1.048	93	27.37	—	—
109	0.037	140	0.002	90	1.797	136	0.096	109	0.037	139	0.002	90	1.797	135	0.096	—	—
105	0.051	97	1.243	117	0.230	107	6.443	104	0.051	97	1.243	117	0.230	106	6.443	107	2.090
111	0.033	98	1.232	115	0.262	104	13.76	110	0.033	98	1.232	115	0.262	103	13.76	111	1.962
97	0.089	121	0.109	99	1.074	122	1.120	96	0.089	120	0.109	99	1.074	121	1.120	—	—
122	0.011	105	0.596	120	0.191	115	2.151	121	0.011	105	0.596	119	0.191	114	2.151	103	3.295
94	0.129	93	1.825	103	0.849	94	25.56	94	0.129	93	1.825	103	0.849	94	25.56	117	0.300
114	0.026	123	0.102	—	—	128	0.696	113	0.026	122	0.102	—	—	127	0.696	94	6.000
125	0.007	119	0.126	128	0.029	124	1.001	125	0.007	118	0.126	127	0.029	123	1.001	—	—
126	0.007	118	0.127	127	0.038	123	1.090	124	0.007	117	0.127	126	0.038	122	1.090	106	2.244
130	0.004	129	0.049	123	0.093	131	0.506	128	0.004	128	0.049	122	0.093	130	0.506	—	—

OGJ150

Rank by total assets 2008	Rank by total assets 2007	Company	Total assets $1,000	Total revenue Rank	Total revenue $1,000	Net income Rank	Net income $1,000	Stockholders' equity Rank	Stockholders' equity $1,000	Capital & expl. spending Rank	Capital & expl. spending $1,000
125	—	**Rock Energy Inc.**	16,024	137	627	94	(5,650)	120	1,046	107	7,159
126	125	**John D. Oil and Gas Co.**	14,817	122	4,884	86	(2,211)	121	983	115	3,245
127	132	**Mexco Energy Corp.**[24]	13,203	126	3,095	65	2,976	106	8,460	116	3,060
128	127	**FieldPoint Petroleum Corp.**	12,793	118	6,611	72	590	105	9,059	124	712
129	135	**Texas Vanguard Oil Co.**	11,261	113	9,745	67	2,780	104	9,990	120	1,063
130	145	**EnerJex Resources Inc.**[24]	10,868	123	3,603	92	(4,828)	118	1,434	105	9,530
131	136	**Pyramid Oil Co.**	10,277	117	6,700	69	1,514	107	8,352	119	1,127
132	138	**Oakridge Energy Inc.**[27]	7,878	131	1,731	81	(653)	110	6,862	128	73
133	139	**Sabine Royalty Trust**	7,118	87	91,180	47	[25]89,009	112	[26]6,735	—	—
134	137	**Apache Offshore Investment Partnership**	6,680	115	[22]7,974	62	5,335	114	5,191	121	956
135	133	**Permian Basin Royalty Trust**	6,318	82	112,432	44	[25]111,459	119	[26]1,171	—	—
136	—	**Glen Rose Petroleum Corp.**[24]	6,074	141	[1]62	89	(3,252)	117	3,116	129	51
137	134	**Daybreak Oil & Gas Inc.**[27]	3,539	140	210	77	(130)	116	3,162	123	717
138	141	**Miller Petroleum Inc.**[28]	2,934	136	831	88	(2,436)	124	(2,742)	—	—
139	—	**Aztec Oil & Gas Inc.**[21]	2,603	139	372	83	(1,109)	123	(1,507)	131	5
140	130	**Blue Dolphin Energy Co.**[5]	560	138	541	80	[29](371)	—	NA	122	749
141	142	**GSV Inc.**	390	135	856	87	(2,300)	122	(382)	126	320
		Total	**1,077,073,558**		**1,310,953,548**		**72,306,070**		**488,041,407**		**162,792,194**

NA = Not Available. (s) indicates less than 500 bbl or 500 mcf. [1]Operating. [2]Net operating. [3]Includes Canada. [4]Subsidiary of Dominion Resources Inc. [5]Oil and gas operations only. [6]Includes some liquids. [7]Net. [8]Includes NGL. [9]Subsidiary of Energen Co. [10]Before depreciation, depletion and amortization. [11]MMcfe [12]Subsidiary of MDU Resources Group. [13]Fiscal yearend Sept. 30. [14]Subsidiary of National Fuel Gas Co. [15]Fiscal yearend Jan. 31, 2009.

Worldwide 2008 liquids — production — Rank	Mill bbl	Worldwide 2008 natural gas — production — Rank	Bcf	Worldwide 2008 liquids — reserves — Rank	Mill bbl	Worldwide 2008 natural gas — reserves — Rank	Bcf	US 2008 liquids — production — Rank	Mill bbl	US 2008 natural gas — production — Rank	Bcf	US 2008 liquids — reserves — Rank	Mill bbl	US 2008 natural gas — reserves — Rank	Bcf	US 2008 net wells — drilled — Rank	Wells
—	—	132	0.040	132	0.010	132	0.446	—	—	131	0.040	131	0.010	131	0.446	—	—
123	0.010	106	0.515	130	0.018	116	2.147	122	0.010	106	0.515	129	0.018	115	2.147	79	13.00
119	0.018	112	0.379	118	0.217	106	7.857	118	0.018	111	0.379	118	0.217	105	7.857	114	1.130
104	0.056	117	0.135	102	0.937	113	2.386	102	0.056	116	0.135	102	0.937	112	2.386	—	—
103	0.056	113	0.346	112	0.358	114	2.331	103	0.056	112	0.346	112	0.358	113	2.331	112	1.760
106	0.044	138	0.018	96	1.372	133	0.401	105	0.044	137	0.018	96	1.372	132	0.401	60	68.00
101	0.065	139	0.005	110	0.471	135	0.155	100	0.065	138	0.005	109	0.471	134	0.155	115	1.000
120	0.016	137	0.020	106	0.644	137	0.080	119	0.016	136	0.020	106	0.644	136	0.080	—	—
74	0.387	83	4.856	71	5.870	88	37.22	74	0.387	83	4.856	71	5.870	88	37.22	—	NA
110	0.037	109	0.468	109	0.492	112	2.422	108	0.037	109	0.468	108	0.492	111	2.422	118	0.070
66	0.760	86	3.673	72	5.860	96	20.66	66	0.760	86	3.673	72	5.860	96	20.66	—	—
133	0.001	—	—	108	0.527	—	—	133	0.001	—	—	107	0.527	—	—	—	—
129	0.004	135	0.027	131	0.017	—	—	129	0.004	134	0.027	130	0.017	—	—	109	2.000
127	0.005	131	0.040	126	0.074	118	1.852	126	0.005	130	0.040	125	0.074	117	1.852	—	NA
134	0.001	134	0.031	133	0.005	130	0.561	134	0.001	133	0.031	132	0.005	129	0.561	—	—
135	(s)	130	0.045	134	0.001	134	0.158	135	(s)	129	0.045	134	0.001	133	0.158	—	—
132	0.002	127	0.065	—	—	138	0.031	131	0.002	126	0.065	135	(s)	137	0.031	—	—
	2,789		**15,924**		**31,496**		**204,204**		**983**		**10,023**		**12,516**		**132,290**		**25,122.8**

[16]Fiscal yearend May 31. [17]Fiscal yearend June 30. [18]Sales. [19]Subsidiary of DTE Energy Inc. [20]Gross. [21]Fiscal yearend Aug. 31. [22]Partners equity. [23]Fiscal yearend Oct. 31. [24]Fiscal yearend Mar. 31. [25]Distributable income. [26]Trust corpus. 27. Fiscal yearend Feb. 28, 2009. [28]Fiscal yearend Apr. 30. [29]Before income taxes.

OGJ100 firms log increases in 2008 earnings, capex

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Oil & Gas Journal's survey of the 100 leading oil and gas producers based outside the US shows that most of these firms posted improved financial results from a year earlier. Higher operating costs offset strong oil and gas prices, though, for some of the companies.

The OGJ100 list of oil and gas producers allows for the comparison of size and results of the entities for which financial results and production and reserves data are available. For many of the national oil companies included in the report, no such 2008 information on assets, revenues, earnings, or capital expenditures is available. So the 100 companies are grouped by region according to locations of corporate headquarters, and only the leaders in oil production and reserves are ranked.

Top 20 in production

Leading the OGJ100 list of oil production leaders for 2008 is Saudi Aramco, which reported total output of 3.25 billion bbl for the year. Aramco's total oil production a year earlier was 3.1 billion bbl.

With total oil production of 1.4 billion bbl, National Iranian Oil Co. (NIOC) was the second-leading producer, followed by Petroleos de Venezuela SA (PDVSA) and Petroleos Mexicanos.

Pemex, which has faced declining output since 2004, reported oil production totaling 1.02 billion bbl for 2008, down from 1.125 billion bbl a year earlier. A handful of other companies on the list of oil output leaders also reported a decline in production from 2007, including Total SA, Royal Dutch Shell PLC, and BP PLC.

Oil reserves leaders

Aramco, NIOC, Iraq National Oil Co., and Kuwait Petroleum Corp. lead the OGJ100 in oil reserves. These are the same entities that led the list a year ago.

With 99.377 billion bbl, PDVSA is fifth among the oil reserves leaders. This amount, unchanged from the previous edition of the OGJ100 (OGJ, Sept. 15, 2008, p. 34), includes proved developed and undeveloped reserves of extra-heavy crude oil.

PDVSA has released more recent figures listing such reserves at 172.323 billion bbl. Including only the developed reserves, PDVSA pegs its proved oil reserves at 16.298 billion bbl.

Financial results

As they did the US-based producers, high operating costs affected the 2008 financial results of the OGJ100 companies.

Although Shell reported 29% higher revenues, higher costs and taxes resulted in a 15% decline in the company's 2008 earnings.

In terms of total assets at yearend 2008, EnCana Corp. is the largest Canadian operator. The Calgary-based company, which plans to split into two companies by the end of this year, reported assets of $47.2 billion and a 50% jump to $5.9 billion in earnings from a year earlier. The earnings gain was primarily due to an after-tax unrealized mark-to-market hedging gain.

Collectively, the Canadian companies in the group posted a 38% increase in 2008 earnings from a year earlier. The group's combined capital and exploration spending climbed 26% to $50.2 billion.

The group of firms based in Europe reported a combined 34% surge in 2008 capital spending, led by Statoil-Hydro, BP, and Shell. Capital spending by the Asian producers jumped, also, led by PetroChina Co. Ltd. ✦

OGJ100: OIL PRODUCTION AND RESERVE LEADERS

Rank	Company	Production, million bbl
1	Saudi Arabian Oil Co.	3,248.5
2	National Iranian Oil Co.	1,423.5
3	Petroleos de Venezuela SA	1,180.8
4	Petroleos Mexicanos	1,019.1
5	Abu Dhabi National Oil Co.	894.3
6	BP PLC	876.4
7	PetroChina Co. Ltd.	870.7
8	Iraq National Oil Co.	863.2
9	Kuwait Petroleum Corp.	846.8
10	OAO Rosneft	776.3
11	Petroleo Brasileiro SA	722.7
12	Nigerian National Petroleum Corp.	708.1
13	OAO Lukoil	702.9
14	Sonangol	668.0
15	National Oil Corp. (Libya)	627.8
16	Royal Dutch Shell	617.9
17	Total SA	531.4
18	Sonatrach	481.8
19	OJSC Surgutneftegas	453.7
20	StatoilHydro	380.0
Total		**17,893.8**

Rank	Company	Reserves, million bbl
1	Saudi Arabian Oil Co.	259,900.0
2	National Iranian Oil Co.	136,150.0
3	Iraq National Oil Co.	115,000.0
4	Kuwait Petroleum Corp.	101,500.0
5	Petroleos de Venezuela SA	99,377.0
6	Abu Dhabi National Oil Co.	92,200.0
7	National Oil Corp. (Libya)	43,660.0
8	Nigerian National Petroleum Corp.	36,220.0
9	OAO Rosneft	17,694.0
10	Qatar Petroleum Corp.	15,210.0
11	OAO Lukoil	14,458.0
12	Sonatrach	12,200.0
13	PetroChina Co. Ltd.	11,221.3
14	Petroleos Mexicanos	10,501.3
15	Petroleo Brasileiro SA	9,109.0
16	Sonangol	9,040.0
17	Total SA	5,695.0
18	BP PLC	5,665.0
19	Petroleum Development Oman LLC	5,500.0
20	Petronas	5,460.0
Total		**1,005,760.6**

OGJ100

LEADING OIL AND GAS COMPANIES OUTSIDE THE US

Country	Company	Total assets		Total revenues		Total net income		Capital and exploratory expenditures	
		Million $							
		2008	2007	2008	2007	2008	2007	2008	2007
CANADA									
Canada	Advantage Oil & Gas Ltd.	1,883.5	2,451.4	695.6	519.0	(19.3)	(7)	245.9	173.2
Canada	ARC Energy Trust	3,077.4	3,575.4	1,599.6	1,165.4	499.6	461.2	514.3	369.8
Canada	Baytex Energy Ltd.	1,480.6	1,424.1	948.6	566.7	243.6	123.7	173.5	138.5
Canada	Bonavista Energy Trust	2,077.8	2,269.0	1,157.1	848.5	411.0	203.2	452.1	341.2
Canada	Canadian Natural Resources Ltd.	34,845.1	36,547.4	13,269.8	10,383.6	4,672.9	2,428.3	6,984.6	5,982.3
Canada	Canadian Oil Sands Trust	5,664.3	7,358.3	4,258.6	3,382.7	1,427.7	691.8	263.4	170.4
Canada	Canadian Superior Energy Inc.	343.3	257.8	57.7	38.1	(22.2)	(9.2)	(112.3)	23.3
Canada	Compton Petroleum Corp.	1,788.1	2,284.1	572.1	471.3	(40.3)	120.4	306.6	358.9
Canada	EnCana Corp.	47,247.0	46,974.0	30,064.0	21,700.0	5,944.0	3,959.0	8,254.0	8,737.0
Canada	Enerplus Resources Fund	5,090.0	4,359.8	2,160.0	1,412.6	833.3	316.3	1,740.1	612.9
Canada	Harvest Energy Trust	4,694.0	5,517.1	5,145.8	3,789.2	198.7	(23.8)	254.3	280.0
Canada	Husky Energy Inc.	21,668.5	21,957.4	23,154.7	14,448.8	3,519.0	2,992.6	3,850.8	2,769.1
Canada	Imperial Oil Ltd.	13,917.6	16,482.4	29,284.4	23,341.7	3,635.2	2,968.3	1,277.7	910.6
Canada	Nexen Inc.	18,013.2	18,197.8	7,705.4	6,071.7	1,607.6	1,011.2	2,874.1	3,166.7
Canada	Paramount Resources Ltd.	912.8	1,315.4	259.9	263.9	(109.3)	387.5	234.4	248.4
Canada	Pengrowth Energy Trust	4,344.2	5,297.1	1,813.5	1,622.5	371.1	334.9	478.8	729.1
Canada	Penn West Energy Trust	12,591.6	8,534.2	4,359.8	1,703.0	1,144.6	163.9	979.6	1,024.2
Canada	Petrobank Energy and Resources Ltd.	1,929.5	1,159.7	829.5	213.4	229.2	75.8	853.0	475.1
Canada	Petro-Canada	24,818.0	24,138.2	26,045.7	19,785.9	2,937.8	2,544.7	5,946.9	3,713.2
Canada	Peyto Energy Trust	1,045.9	1,206.5	392.7	376.2	168.2	194.5	130.6	113.2
Canada	Provident Energy Trust	2,511.5	5,827.9	3,036.4	1,898.0	147.5	28.3	231.4	165.8
Canada	Sherritt International Corp.	7,800.1	5,530.1	1,510.7	1,248.0	(271.6)	344.9	2,070.5	933.7
Canada	Suncor Energy Inc.	26,575.4	24,803.1	28,205.4	17,285.9	2,003.2	2,777.5	7,114.9	5,041.9
Canada	Talisman Energy Inc.	19,832.7	21,677.0	9,192.1	7,031.7	3,298.7	1,934.8	4,786.4	3,100.6
Canada	Vermilion Energy Trust	1,469.3	1,688.1	816.6	567.8	214.9	153.0	220.4	276.4
LATIN AMERICA									
Argentina	Techint Tecpetrol SA[6]	NA	NA	NA	NA	NA	NA	NA	NA
Barbados	Barbados National Oil Co. Ltd.[6]	151.0	138.5	229.4	208.6	(34.6)	0.7	1.5	3.8
Brazil	Petroleo Brasileiro SA	125,695.0	129,715.0	118,257.0	87,735.0	18,879.0	13,138.0	29,874.0	20,978.0
Colombia	Ecopetrol	21,428.0	23,855.2	16,636.7	10,757.8	5,908.4	2,495.0	NA	1,507.0
Cuba	Cubapetroleo	NA	NA	NA	NA	NA	NA	NA	NA
Ecuador	Petroleos del Ecuador	NA	NA	NA	NA	NA	NA	NA	NA
Mexico	Petroleos Mexicanos	91,358.4	122,400.0	98,162.2	113,376.3	(8278.5)	(1,827.0)	NA	NA
Suriname	State Oil Co. Suriname Ltd.	679.1	489.4	564.9	331.8	230.5	146.7	85.8	68.4
Trinidad and Tobago	Petroleum Co. of Trinidad and Tobago Ltd. (Petrotrin)[2]	4,851.0	4,045.0	6,417.0	4,204.0	374.0	195.0	580.0	551.0
Venezuela	Petroleos de Venezuela SA	131,832.0	106,894.0	126,364.0	96,242.0	9,413.0	6,273.0	12,836.0	7,955.0
EUROPE									
Austria	OMV AG	29,753.3	31,031.4	37,560.4	27,475.6	2,248.4	2,526.6	5,215.9	5,645.4
Denmark	Dong Energy AS	19,827.3	17,574.2	11,924.4	7,650.7	944.7	599.0	2,020.9	2,173.1
Denmark	Maersk Oil & Gas	10,530.0	9,864.0	13,494.0	9,465.0	2,361.0	1,628.0	NA	NA
Finland	Neste Oil[10]	6,569.8	7,113.1	22,120.7	16,592.0	148.5	795.1	747.0	457.9
France	Total SA	164,675.7	165,803.9	235,766.7	187,572.0	16,106.4	18,555.1	20,057.6	16,069.7
Germany	RWE Dea AG	4,520.2	5,118.1	2,905.7	2,240.1	638.2	674.5	891.1	692.3
Germany	Wintershall AG	11,630.7	10,305.3	23,057.4	16,047.8	1,398.4	1,081.6	2,427.8	3,125.7
Greece	Hellenic Petroleum SA	7,041.5	7,514.7	14,897.6	11,704.7	1,282.3	354.5	496.4	160.5
Hungary	MOL Group PLC	16,976.0	13,236.0	20,576.0	14,113.0	822.0	1,428.0	3,370.0	1,977.0
Ireland	Dragon Oil PLC	1,768.8	1,318.2	706.1	596.6	369.0	303.9	287.0	228.0
Ireland	Tullow Oil PLC	5,182.3	3,877.5	1,291.5	1,112.7	422.3	91.6	289.6	369.4
Italy	ENI	162,281.6	148,162.0	160,090.4	120,753.0	14,055.0	14,818.1	21,413.4	14,521.9
Netherlands	Royal Dutch Shell	282,401.0	269,470.0	458,361.0	355,782.0	26,476.0	31,331.0	35,065.0	24,576.0
Norway	StatoilHydro	82,945.9	80,675.9	115,465.1	89,048.2	7,663.1	7,620.2	57,257.7	43,950.5
Poland	Polish Oil & Gas Company	10,039.0	11,548.3	7,649.3	6,021.4	359.3	331.2	NA	NA
Romania	Romanian National Oil Co. (Petrom)	8,579.9	8,581.9	[8]6,611.6	[8]5,031.5	403.4	728.3	2,527.7	1,564.7
Russia	OAO Gazprom	235,129.0	276,457.0	141,462.2	94,748.9	31,009.5	27,173.9	28,731.5	21,247.7
Russia	OAO Lukoil	71,461.0	59,632.0	107,680.0	81,891.0	9,144.0	9,511.0	10,525.0	9,071.0

Worldwide oil production (Million bbl) 2008	Worldwide oil production (Million bbl) 2007	Worldwide natural gas production (Bcf) 2008	Worldwide natural gas production (Bcf) 2007	Worldwide oil reserves (Million bbl) 2008	Worldwide oil reserves (Million bbl) 2007	Worldwide natural gas reserves (Bcf) 2008	Worldwide natural gas reserves (Bcf) 2007
4.3	3.8	44.9	42.7	57.3	61.1	704.3	546.4
[1]11.8	[1]11.9	71.7	65.7	[1]153.0	[1]158.3	1,012.2	768.2
[1]11.4	[1]10.1	20.0	18.9	[1]157.4	[1]143.3	[3]178.2	[3]148.9
[1]9.0	[1]9.0	62.4	62.1	[1]65.0	[1]63.7	462.6	427.1
[1]115.2	[1]120.8	545.7	608.8	[1]1,346.0	[1]1,358.0	3,684.0	3,666.0
39.0	41.0	NA	NA	[3]1,800.0	[3]1,800.0	NA	NA
NA	0.2	NA	4.9	NA	[1]1.0	NA	25.3
[1]1.7	[1]2.6	52.2	52.9	[1]325.8	[1]331.6	[3]1,119.5	[3]1,120.0
[1 5]48.7	[1]549.0	[5]1,400.9	[5]1,302.0	[1]51,005.6	[1]5927.2	[5]13,678.0	[5]13,300.0
[1]14.6	[1]14.9	126.4	95.7	[1]3184.4	[1]3176.4	[3]1,487.7	[3]1,202.3
[1]14.6	[1]16.1	35.2	35.7	[1]3142.4	[1]3145.8	268.4	278.7
[1]93.7	[1]99.5	217.0	227.5	[1]531.0	[1]649.0	2,190.0	2,191.0
[1]77.7	[1]83.2	90.9	147.5	[1]630.0	[1]717.0	593.0	635.0
[1]65.0	[1]63.3	70.4	73.0	244.0	281.0	464.0	423.0
[1]1.3	[1]1.3	22.3	28.8	[1]39.1	[1]39.1	[3]163.9	[3]192.8
[1]15.3	[1]15.7	88.1	97.4	[1]3181.5	[1]3175.0	[3]852.0	[3]870.0
[1]39.3	[1]26.4	178.9	120.2	[1]3483.0	[1]3332.0	[3]1,476.0	[3]901.0
15.6	[1]1.3	5.3	4.2	[1]348.2	[1]336.7	[3]68.0	[3]62.4
[1]97.0	[1]70.0	258.0	266.0	671.0	672.0	1,494.0	1,759.0
1.2	1.3	36.6	37.4	NA	NA	NA	NA
[1]5.0	[1]7.6	30.7	39.1	37.6	98.6	226.1	696.2
NA	NA	NA	NA	NA	NA	NA	NA
[1]1.1	[1]1.1	73.7	71.5	[1]37.0	[1]36.0	567.0	426.0
[1]81.6	[1]87.8	455.2	455.1	NA	[1]749.3	NA	5,464.2
[1]7.1	[1]6.9	29.0	27.4	[1]377.6	[1]381.6	[3]249.2	[3]248.3
NA	NA	NA	NA	NA	NA	NA	NA
0.3	0.3	0.7	0.8	2.2	2.2	4.9	4.6
[7]22.7	700.2	NA	656.0	9,109.0	9,613.0	12,215.0	12,547.0
[1]32.1	119.5	177.4	147.5	NA	1,450.0	NA	2,439.0
50.5	52.0	14.0	14.0	NA	NA	NA	NA
[7]184.3	[7]186.9	NA	[7]0.3	[7]4,700.0	[7]4,517.0	[7]315.0	NA
[1]1,019.1	[1]1,124.9	2,525.4	2,211.2	10,501.3	11,047.6	11,793.2	12,578.1
5.9	5.4	NA	NA	82.3	79.6	NA	NA
[1]18.1	[1]19.5	53.0	54.1	[1]346.5	[1]308.2	581.3	611.2
1,180.8	1,060.0	NA	89.7	[1]499,377.0	99,377.0	176,015.0	170,920.0
[1]60.9	[1]59.8	308.0	321.6	[1]696.4	[1]698.3	2,825.2	2,878.0
10.0	9.1	8.5	2.2	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA
[1]531.4	[1]550.8	1,765.5	1,766.2	5,695.0	5,778.0	26,218.0	25,730.0
[1]15.8	[1]17.3	117.4	113.5	[3]165.4	[3]183.7	[3]1.7	[3]1.8
59.0	64.0	431.0	291.0	271.0	264.0	5,268.0	5,210.0
NA	NA	NA	NA	NA	NA	NA	NA
12.8	16.4	51.9	36.9	65.6	109.1	377.0	426.2
15.0	11.7	NA	NA	[3]636.0	[3]651.0	NA	NA
24.4	14.5	56.6	70.5	[3]314.1	[3]294.0	[3]334.6	[3]384.7
374.5	372.3	1,614.6	1,501.6	3,335.0	3,925.0	18,748.0	11,204.0
[1]617.9	[1]663.6	2,347.7	2,250.4	[1]53,435.0	[1]53,776.0	[5]43,318.0	[5]40,895.0
[1]380.0	[1]391.0	1,469.0	1,352.0	[1]2,074.0	[1]2,389.0	18,984.0	20,319.0
127.9	136.1	144.8	151.9	154.8	154.8	3,282.9	3,459.4
[1]28.6	[1]28.6	196.0	203.1	[1]843.0	[1]863.0	NA	NA
233.6	248.2	19,412.1	19,373.3	NA	NA	[7]171,176.0	[7]171,176.0
702.9	713.0	601.0	[7]340.9	14,458.0	15,715.0	29.3	27.9

OGJ100

LEADING OIL AND GAS COMPANIES OUTSIDE THE US

Country	Company	Total assets		Total revenues		Total net income		Capital and exploratory expenditures	
		Million $							
		2008	2007	2008	2007	2008	2007	2008	2007
Russia	OAO Rosneft	77,513.0	74,805.0	68,991.0	49,216.0	11,120.0	12,862.0	8,732.0	6,240.0
Russia	OJSC Surgutneftegas	36,614.5	37,049.9	21,977.1	23,299.0	5,785.5	3,465.3	NA	NA
Spain	Compania Espanol de Petroleos SA	13,433.1	13,786.7	33,573.0	29,104.2	770.5	1,025.4	2,321.9	870.5
Spain	Repsol YPF SA	68,800.2	68,873.6	89,663.7	76,664.8	4,171.8	4,599.4	NA	NA
Sweden	Lundin Petroleum AB	3,210.6	3,149.3	950.4	792.3	47.0	141.0	696.1	581.4
Turkey	Turkish Petroleum Corp.	5,540.3	5,000.3	2,175.5	2,223.1	1,505.4	1,652.7	NA	NA
United Kingdom	BG Group PLC	36,541.7	30,543.0	23,274.7	16,596.1	5,834.4	3,603.1	1,328.0	608.5
United Kingdom	BP PLC	228,238.0	236,076.0	365,700.0	288,951.0	21,666.0	21,169.0	30,700.0	20,641.0
United Kingdom	Cairn Energy PLC	3,620.4	2,381.0	[8]299.3	[8]288.0	366.7	1,528.0	692.2	400
United Kingdom	Premier Oil PLC	1,451.0	1,514.1	655.0	578.2	98.0	39.0	230.0	254.0
AFRICA									
Algeria	Sonatrach	NA	NA	NA	NA	NA	NA	NA	NA
Angola	Sonangol	NA	NA	NA	NA	NA	NA	NA	NA
Egypt	Egyptian General Petroleum Corp.	NA	NA	NA	NA	NA	NA	NA	NA
South Africa	Sasol Limited[4]	17,894.0	16,913.0	[8]10,224.0	[8]8,333.0	3,223.0	2,438.0	NA	NA
Libya	National Oil Corp.	NA	NA	NA	NA	NA	NA	NA	NA
Morocco	Office National des Hydrocarbons et des Mines (ONHYM)	NA	NA	NA	NA	NA	NA	NA	NA
Nigeria	Nigerian National Petroleum Corp.	NA	NA	NA	NA	NA	NA	NA	NA
MIDDLE EAST									
Abu Dhabi	Abu Dhabi National Oil Co.	NA	NA	NA	NA	NA	NA	NA	NA
Bahrain	Bahrain National Oil Co.	NA	NA	NA	NA	NA	NA	NA	NA
Dubai	Dubai Petroleum Co.	NA	NA	NA	NA	NA	NA	NA	NA
Iran	National Iranian Oil Co.	NA	NA	NA	NA	NA	NA	NA	NA
Iraq	Iraq National Oil Co.	NA	NA	NA	NA	NA	NA	NA	NA
Israel	Ministry of Energy & Infrastructure	NA	NA	NA	NA	NA	NA	NA	NA
Kuwait	Kuwait Petroleum Corp.[6]	NA	NA	NA	NA	NA	NA	NA	NA
Oman	Petroleum Development Oman LLC	NA	NA	NA	NA	NA	NA	3,089.0	2,382.0
Qatar	Qatar Petroleum Corp.	NA	NA	NA	NA	NA	NA	NA	NA
Saudi Arabia	Saudi Arabian Oil Co.	NA	NA	NA	NA	NA	NA	NA	NA
ASIA PACIFIC									
Australia	Australia Worldwide Exploration Ltd.[4]	676.1	627.2	700.2	121.0	225.3	29.7	68.6	19.2
Australia	BHP Billiton Petroleum[4]	75,889.0	61,404.0	51,918.0	41,271.0	15,962.0	13,496.0	1,350.0	805.0
Australia	Samson Oil & Gas[4]	28.7	40.0	18.2	152.3	(6.9)	(5.1)	2.5	1.8
Australia	Santos Ltd.	6,844.7	6,424.2	2,390.7	2,112.4	1,406.4	252.8	1,345.9	1,146.7
Australia	Woodside Petroleum Ltd.	10,424.9	8,539.0	5,105.3	3,222.6	1,522.2	864.2	4,090.2	2,219.7
China	China National Offshore Oil Corp. Ltd.	60,032.7	42,363.9	28,031.7	21,303.0	6,385.6	4,110.4	5,145.0	3,847.0
China	PetroChina Co. Ltd.	149,254.5	117,822.4	[8]154,137.9	[8]112,991.3	18,376.3	20,291.9	33,415.6	23,878.2
China, Taiwan	Chinese Petroleum Corp.	17,992.6	18,386.0	30,356.3	27,166.4	(4,417.8)	436.1	NA	NA
India	Gujarat State Petroleum Corp. Ltd.	NA	NA	NA	NA	NA	NA	NA	NA
India	Oil & Natural Gas Corp. Ltd.[6]	26,071.8	25,868.9	14,632.3	14,543.1	3,709.1	4,058.5	NA	NA
India	Oil India Ltd.[6]	18,487.5	21,507.4	15,629.6	14,598.9	4,114.5	3,985.2	NA	NA
Indonesia	MedcoEnergi	1,980.2	2,179.8	1,286.3	1,078.0	280.2	6.6	295.4	384.8
Indonesia	Pertamina	NA	NA	NA	NA	NA	NA	NA	NA
Japan	Japan Petroleum Exploration Co. Ltd.[6]	6,830.4	5,202.5	2,014.1	1,445.2	194.9	178.3	404.9	269.8
Malaysia	Petronas[6]	106,039.0	85,217.0	66,215.0	50,984.0	20,002.0	14,446.0	8,550.0	5,992.0
Myanmar	Myanma Oil & Gas Enterprise	NA	NA	NA	NA	NA	NA	NA	NA
New Zealand	New Zealand Oil and Gas Ltd.[4]	221.6	172.8	107.1	2.2	44.3	2.9	55.7	54.5
Pakistan	Pakistan Oilfields Ltd.[4]	NA	405.3	NA	8235.0	NA	104.2	NA	55.5
Pakistan	Pakistan Petroleum Ltd.	1,257.1	1,279.4	1,051.5	9,327.0	453.3	407.5	162.8	97.9
Thailand	PTT Exploration and Production Public Co. Ltd.	6,862.1	6,442.3	4,242.2	3,000.0	1,262.7	882.1	250.7	109.8

NA = not available. All financial data are given in millions of US dollars. End of period exchange rates are used for assets. Annual averages are used for other financial data. Fiscal yearend is Dec. 31 unless otherwise noted. [1]Includes NGL. [2]Fiscal yearend is Sept. 30. [3]Proved and probable. [4]Fiscal yearend is June 30. [5]After royalty. [6]Fiscal yearend is Mar. 31. [7]Estimate. [8]Turnover. [9]Fiscal yearend is Mar. 20. [10]Separated from Fortum Oil. [11]Oil sands. [12]Miller & Lent's audit according to US SEC specifications. [13]Excludes Petrom. [14]Petroleos de Venezuela SA has reported

Worldwide oil production — Million bbl		Worldwide natural gas production — Bcf		Worldwide oil reserves — Million bbl		Worldwide natural gas reserves — Bcf	
2008	2007	2008	2007	2008	2007	2008	2007
776.3	740	437.9	554.4	17,694.0	17,513.0	27,686.2	25,108.3
453.7	474.3	497.9	497.9	NA	NA	NA	NA
44.5	42.3	NA	NA	NA	88.0	NA	NA
162.1	176.2	1,046.1	1,140.6	951.6	952.0	7,341.1	8,136.8
11.8	12.7	NA	NA	[3]189.1	[3]169.8	189.4	162.5
10.3	10.3	17.5	14.9	NA	NA	NA	NA
165.9	163.9	900.5	875.8	[1]532.7	[1]392.9	6,769.0	5,572.0
[5]876.4	[5]881.1	[5]3,041.9	[5]2,972.2	[1]5,665.0	[1]5,492.0	40,005.0	41,130.0
2.5	3.0	18.7	27.0	[3]250.0	[3]164.0	[3]30.0	[3]35.0
[1]4.0	[1]4.4	54.0	49.0	[1]349.5	[1]338.1	1,016.0	998.0
[7]481.8	[7]494.6	[7]3,300.0	[7]3,310.0	[7]12,200.0	[7]12,200.0	[7]159,000.0	[7]159,000.0
[7]668.0	[7]618.7	[7]59.1	[7]40.9	[7]9,040.0	[7]9,035.0	[7]9,530.0	[7]9,530.0
[7]247.8	[7]232.5	NA	NA	[7]3,700.0	[7]3,700.0	[7]58,500.0	[7]58,500.0
2.3	2.1	65.4	58.2	[3]10.5	[3]14.1	[3]1,214.0	31,276.6
[7]627.8	[7]620.5	[7]415.0	[7]265.9	[7]43,660.0	[7]41,464.0	[7]54,380.0	[7]50,100.0
NA	7NA	NA	NA	[7]0.8	[7]0.8	[7]53.0	[7]55.0
[7]708.1	[7]791.0	[7]957.0	[7]860.0	[7]36,220.0	[7]36,220.0	[7]184,160.0	[7]183,990.0
[7]894.3	[7]846.8	NA	NA	[7]92,200.0	[7]92,200.0	[7]198,500.0	[7]198,500.0
[7]62.1	[7]62.8	[7]329.6	[7]317.7	[7]124.6	[7]124.6	[7]3,250.0	[7]3,250.0
[7]40.2	[7]34.7	NA	NA	[7]4,000.0	[7]4,000.0	[7]4,000.0	[7]4,000.0
[7]1,423.5	[1]1,429.7	3,515.0	2,970.0	[7]136,150.0	[7]138,400.0	[7]991,600.0	[7]948,200.0
[7]863.2	[7]759.2	[7]241.2	[7]58.5	[7]115,000.0	[7]115,000.0	[7]111,940.0	[7]111,940.0
NA	NA	NA	NA	[7]1.9	[7]1.9	1,075.0	[7]1,075.0
846.8	788.4	501.0	371.0	[7]101,500.0	[7]101,500.0	[7]62,860.0	[7]55,515.0
202.9	204.8	797.2	813.5	[7]5,500.0	[7]5,500.0	[7]30,000.0	[7]30,000.0
[7]312.1	[7]292.0	2,170.0	1,825.0	[7]15,210.0	[7]15,207.0	[7]891,945.0	[7]905,300.0
3,248.5	3,102.5	3,029.5	2,920.0	259,900.0	259,900.0	263,000.0	253,800.0
6.9	0.9	15.6	15.1	18.0	17.5	[3]170.3	[3]180.8
[1]68.2	[1]56.7	368.0	355.7	[1]321.1	[1]565.1	2,370.1	4,727.2
NA	NA	NA	NA	0.5	0.5	13.5	18.6
[5]9.6	[5]11.9	[5]221.8	[5]233.0	[3][5]125.0	[3][5]122.0	[3][5]4,849.6	[3][5]4,110.4
31.6	22.8	224.0	204.0	168.8	170.2	7,883.0	7,785.0
154.1	135.7	226.7	204.3	[5]1,578.3	[5]1,564.1	[5]5,623.3	[5]6,222.8
870.7	838.8	1,864.1	1,627.0	11,221.3	11,706.0	61,189.2	57,111.0
5.4	5.7	12.6	14.7	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA
29.2	22.6	NA	80.0	NA	NA	NA	NA
74.9	18.4	186.5	46.4	74.9	104.7	166.5	253.2
NA	NA	NA	NA	NA	NA	NA	NA
7.4	7.4	45.4	45.5	NA	NA	NA	NA
252.4	241.3	2,007.0	1,942.6	5,460.0	5,360.0	82,152.0	82,992.0
[7]6.9	[7]4.7	NA	NA	[7]50.0	[7]50.0	[7]10,000.0	[7]10,000.0
1.2	1.8	NA	NA	14.4	13.9	38.0	38.0
NA	[1]5.9	NA	46.7	NA	NA	NA	NA
11.4	[1]0.9	366.4	365.5	[1]23.4	[1]20.5	3,712.9	3,958.7
NA	NA	NA	NA	NA	NA	NA	NA

total proved developed and undeveloped oil reserves of 172.323 billion bbl.

THE OGJ150 COMPANY INDEX

Rank by total assets	Company	Headquarters city
89	Abraxas Petroleum Corp.	San Antonio
116	Adams Resources & Energy Inc.	Houston
99	American Oil & Gas Inc.	Denver
4	Anadarko Petroleum Corp.	The Woodlands, Tex.
10	Apache Corp.	Houston
134	Apache Offshore Investment Partnership	Houston
78	Approach Resources Inc.	Ft. Worth
69	Arena Resources Inc.	Tulsa
119	Aspen Exploration Corp.	Denver
46	Atlas America Inc.	Moon Township, Penn.
44	ATP Oil & Gas Corp.	Houston
91	Aurora Oil & Gas Corp.	Traverse City, Mich.
139	Aztec Oil & Gas Inc.	Houston
118	Basic Earth Science Systems Inc.	Denver
66	Belden & Blake Corp.	Houston
41	Berry Petroleum Co.	Denver
50	Bill Barrett Corp.	Denver
75	Black Hills Corp.	Rapid City, SD
140	Blue Dolphin Energy Co.	Houston
73	Brigham Exploration Co.	Austin, Tex.
32	Cabot Oil & Gas Corp.	Houston
85	Callon Petroleum Co.	Natchez, Miss.
83	Cano Petroleum Inc.	Ft. Worth
59	Carrizo Oil & Gas Inc.	Houston
7	Chesapeake Energy Corp.	Oklahoma City
2	Chevron Corp.	San Ramon, Calif.
29	Cimarex Energy Co.	Denver
61	Clayton Williams Energy Inc.	Midland, Tex.
47	CNX Gas Corp.	Pittsburgh
53	Comstock Resources Inc.	Frisco, Tex.
37	Concho Resources Inc.	Midland, Tex.
3	ConocoPhillips	Houston
68	Contango Oil & Gas Co.	Houston
45	Continental Resources Inc.	Enid, Okla.
97	Credo Petroleum Corp.	Denver
72	Crimson Exploration Inc.	Houston
120	Cross Timbers Royalty Trust	Ft. Worth
106	Cubic Energy Inc.	Dallas
124	Daleco Resources Corp.	West Chester, Pa.
137	Daybreak Oil & Gas Inc.	Spokane, Wa.
51	Delta Petroleum Corp.	Denver
34	Denbury Resources Inc.	Plano, Tex.
9	Devon Energy Corp.	Oklahoma City
16	Dominion Energy Inc.	Richmond, Va.
93	Dorchester Minerals LP	Dallas
90	Double Eagle Petroleum Co.	Casper, Wy.
79	DTE Gas Resources	Detroit, Mich.
76	Dune Energy Inc.	Houston
77	Edge Petroleum Corp.	Houston
12	El Paso Corp.	Houston
33	Encore Acquisition Co.	Ft. Worth
111	EnDevCo Inc.	Houston
31	Energen Corp.	Birmingham, Ala.
63	Energy Partners Ltd.	New Orleans
130	EnerJex Resources Inc.	Overland Park, Kan.
13	EOG Resources Inc.	Houston
43	EQT Production	Pittsburgh
105	Evolution Petroleum Corp.	Houston
26	Exco Resources Inc.	Dallas
1	ExxonMobil Corp.	Irving, Tex.
52	Fidelity Exploration & Production Co.	Bismarck, ND
128	FieldPoint Petroleum Corp.	Cedar Park, Tex.
104	Foothills Resources Inc.	Bakersfield, Calif.
24	Forest Oil Corp.	Denver
101	FX Energy Inc.	Salt Lake City
92	Gasco Energy Inc.	Englewood, Colo.
102	GeoPetro Resources Co.	San Francisco
87	GeoResources Inc.	Williston, ND
136	Glen Rose Petroleum Corp.	Dallas
70	GMX Resources Inc.	Oklahoma City
60	Goodrich Petroleum Corp.	Houston
141	GSV Inc.	Westport, Conn.
88	Gulfport Energy Corp.	Oklahoma City
25	Helix Energy Solutions Group Inc.	Houston
11	Hess Corp.	New York
98	HKN Inc.	Houston
113	Houston American Energy Corp.	Houston
123	Index Oil & Gas Inc.	Houston
126	John D. Oil & Gas Co.	Mentor, Ohio
42	Kinder Morgan CO_2 Co. LP.	Lakewood, Colo.
64	Layne Christensen Co.	Mission Woods, Kan.
62	Legacy Reserves LP.	Midland, Tex.
115	Lucas Energy Inc.	Houston
5	Marathon Oil Corp.	Houston
35	Mariner Energy Inc.	Houston
57	McMoran Exploration Co.	New Orleans
80	Meridian Resource Corp.	Houston
127	Mexco Energy Corp.	Midland, Tex.
138	Miller Petroleum Inc.	Huntsville, Tenn.
15	Murphy Oil Corp.	El Dorado, Ark.
108	New Century Energy Corp.	Houston
20	Newfield Exploration Co.	Houston
86	NGAS Resources Inc.	Lexington, Ky
14	Noble Energy Inc.	Houston
132	Oakridge Energy Inc.	Wichita Falls, Tex.
6	Occidental Petroleum Corp.	Los Angeles
95	Panhandle Oil and Gas Inc.	Oklahoma City
71	Parallel Petroleum Corp.	Midland, Tex.
114	Pegasi Energy Resources Corp.	Tyler, Tex.
36	Penn Virginia Corp.	Radnor, Pa.
135	Permian Basin Royalty Trust	Ft. Worth
100	Petro Resources Corp.	Houston
22	Petrohawk Energy Corp.	Houston
56	Petroleum Development Corp.	Bridgeport, W. Va.
65	PetroQuest Energy Inc.	Lafayette, La.
112	PetroSearch Energy Corp.	Houston
18	Pioneer Natural Resources Co.	Irving, Tex.
122	Pioneer Oil & Gas	South Jordan, Utah
21	Plains Exploration & Production Co.	Houston
96	Platinum Energy Resources Inc.	Houston
84	PrimeEnergy Corp.	Stamford, Conn.
131	Pyramid Oil Co.	Bakersfield, Calif.
67	Quest Resource Corp.	Oklahoma City
19	Questar Corp.	Salt Lake City
28	Quicksilver Resources Inc.	Ft. Worth
23	Range Resources Corp.	Ft. Worth
107	Reserve Petroleum Co.	Dallas
81	Rex Energy Corp.	State College, Penn.
125	Rock Energy Inc.	Houston
58	Rosetta Resources Inc.	Houston
110	Royale Energy Inc.	San Diego
133	Sabine Royalty Trust	Dallas
109	San Juan Basin Royalty Trust	Ft. Worth
55	Seneca Resources Corp.	Williamsville, NY
27	Southwestern Energy Co.	Houston
117	Spindletop Oil & Gas Co.	Dallas
38	St. Mary Land & Exploration Co.	Denver
48	Stone Energy Corp.	Lafayette, La.
54	Swift Energy Co.	Houston
103	Tengasco Inc.	Knoxville, Tenn.
94	Teton Energy Corp.	Denver
129	Texas Vanguard Oil Co.	Austin, Tex.
121	Tri-Valley Corp.	Bakersfield, Calif.
74	TXCO Resources Inc.	San Antonio
40	Ultra Petroleum	Houston
39	Unit Corp.	Tulsa
49	W&T Offshore Inc.	Houston
82	Warren Resources Inc.	New York
30	Whiting Petroleum Corp.	Denver
17	Williams Cos. Inc.	Tulsa
8	XTO Energy Inc.	Ft. Worth

White House may try to repeal other industries' tax breaks

Nick Snow
Washington Editor

US President Barack Obama's administration is studying whether to propose repeals of tax breaks for other industries besides oil and gas, a US Department of the Treasury official told a US Senate subcommittee on Sept. 10.

Alan B. Krueger, assistant US Treasury secretary for economic policy, mentioned the examination during a hearing by the Senate Finance Committee's Energy, Natural Resources, and Infrastructure Subcommittee on the White House's Fiscal 2010 oil and gas tax proposals.

The examination reflects an administration policy that taxes should be neutral across all businesses unless exceptions are in the national interest, Krueger said. "The Volcker commission subcommittee chaired by Martin Feldstein is looking into incentives for other industries," he said.

Paul A. Volcker, who was Federal Reserve chairman during 1979-87, chairs Obama's Economic Recovery Advisory Board. Feldstein, who was White House Council of Economic Advisors chairman during 1982-84, is one of the board's 15 members.

When a subcommittee member, Jim Bunning (R-Ky.), asked Krueger if the administration was currently singling out the oil and gas industry as it seeks tax incentive repeals, however, the Treasury official replied, "That is correct."

Testing sentiment

Asked following the hearing if it appeared that the White House is using oil and gas as a test of sentiment for repealing more business tax preferences, American Petroleum Institute Chairman J. Larry Nichols told OGJ: "That's what the man said. It's the first time I've heard anyone from the Obama administration admit it."

Nichols, who is Devon Energy Corp.'s chief executive, said he was not particularly surprised. "This is the biggest tax-and-spend administration in history," he said.

"It sounds like the administration is waiting on some other committee to decide what to do. Meanwhile, it didn't have any trouble going after the oil and gas industry," a second trade association leader who testified at the hearing, Independent Petroleum Association of America Chairman Henry G. (Buddy) Kleemeier, told OGJ on Sept. 11.

Kleemeier, who is Kaiser Francis Oil Co.'s chief executive, said he was disappointed there were not any Democrats at the hearing besides the subcommittee's chairman, Jeff Bingaman (D-NM), as he and Nichols explained how badly the White House's oil and gas tax incentive repeal proposals would damage the industry. "We're fighting this hard because it's bad public policy," he said.

In his opening statement, Bingaman said the White House has gone beyond proposals to repeal a manufacturers' tax break for large integrated oil companies and to impose an excise tax on new federal Outer Continental Shelf production. These proposals enjoyed broad bipartisan support when they became part of the Finance Committee's tax bill in 2008, but the measure fell one vote short of cloture once it reached the Senate floor, he noted.

'Would go further'

"I continue to believe those proposals have merit," Bingaman said. "But the president's budget proposal would go further, in that it would disallow the Section 199 deduction for all oil and gas producers, not just the largest integrated firms. I have concerns about that expansion, and believe it will require careful study. I also understand that the administration is refining the OCS excise tax proposal and I look forward to working with them in doing so."

Bingaman said Obama's proposed oil and gas tax changes also place on the table several preferences that have been part of the federal tax code for nearly a century in some cases. The most significant of these are disallowing expensing of intangible drilling costs (IDCs) and requiring them to be capitalized instead; prohibiting percentage depletion for oil and gas firms and requiring cost depletion instead; and increasing the period over which independent producers amortize geological and geophysical costs to 7 from just 2 years, Bingaman said.

Congress will need to consider whether each of these proposals causes

"It sounds like the administration is waiting on some other committee to decide what to do. Meanwhile, it didn't have any trouble going after the oil and gas industry." ***—Henry G. (Buddy) Kleemeier, Independent Petroleum Association of America chairman***

Administration attempts to justify tax proposals surprise API's Gerard

Nick Snow
Washington Editor

American Petroleum Institute Pres. Jack N. Gerard expressed surprise at an Obama administration official's apparent attempt on Sept. 10 to justify proposals to repeal oil and gas tax incentives by saying that it is looking at other industries' tax breaks too.

"It seems that they got the cart before the horse. If they want to look at the tax code generally, we're satisfied with that. But they obviously didn't analyze the entire tax code before they suggested repealing our industry's tax provisions," Gerard told reporters during a Sept. 15 teleconference.

Alan B. Krueger, assistant US Treasury secretary for economic policy, mentioned that the administration was looking at other industries' tax breaks during a Sept. 10 hearing by the Senate Finance Committee's Energy, Natural Resources, and Infrastructure Subcommittee on the White House's Fiscal 2010 oil and gas tax proposals.

When a subcommittee member, Jim Bunning (R-Ky.), asked him if the administration was currently singling out the oil and gas industry as it seeks tax incentive repeals, however, the US Department of the Treasury official replied, "That is correct."

Gerard said he continues to be amazed by Obama administration statements that oil and gas tax incentives should be repealed to prevent overproduction of domestic resources. "The Treasury Department's Green Book says there's too much oil and gas production in the United States. We think that's laughable. We think there needs to be some serious dialogue about what these proposals mean and about ways to get back to producing more oil and gas," he said.

'Ludicrous'

Citing a PricewaterhouseCoopers study commissioned by API that it released on Sept. 9, Gerard said the US oil and gas industry supports 9 million jobs and contributed more than $1 trillion, or 7.5%, to the US gross domestic product in 2007. "For the administration to focus [tax incentive repeals] on an industry that is such an economic engine seems ludicrous during a recession," he maintained.

"We're deeply troubled by what the administration has put forward for a variety of reasons, not the least of which is its apparent belief that there's overproduction of oil and gas in the United States. At a time when it's almost universally accepted on the Hill that there's a need for more energy security, we hope cooler heads will prevail and these proposals will be rejected," he continued.

He said that API has made progress in the past 2 months in getting US House Natural Resources Committee Chairman Nick J. Rahall (D-W.Va.) to modify some of his proposals to reform federal minerals management. But the oil and gas trade association remains concerned with the bill that Rahall introduced on Sept. 8, and that will be the subject of committee hearings on Sept. 16-17, according to Gerard.

"The legislation that's being put forward actually will result in less domestic energy," he explained. "In a preliminary analysis, outside sources say it could result in 18% less natural gas production over the next 30 years. Likewise, it could result in a $37 billion loss to our economy and a $4.7 billion loss in government revenue."

Other concerns

Rahall's bill also would hamper domestic production growth by increasing bureaucracy, and eliminate the federal royalty-in-kind program, which Gerard conceded has been badly managed but which remains a good idea.

He said that in public forums in 19 states during August in which API participated, citizens showed a surprisingly high interest in energy issues. "In Farmington, NM, which is a relatively small community, it was estimated that 1,000 people came to talk about oil and gas. Places like Detroit, where you wouldn't expect many people to show up, attracted hundreds. A surprising number of people came from the farming community," he said.

"Clearly, health care was Issue No. 1 over the August break. Energy was Issue No. 1-A," he added.

Most of the concerns expressed at these forums centered on efforts to control greenhouse gas emissions through a carbon cap-and-trade program, Gerard said.

"I've had a number of conversations with members of Congress and believe that if the Waxman-Markey bill went to the House floor today, it wouldn't pass. When you look at the Senate dynamic, with a lot of different people from both parties, you see several Democrats concerned about job loss and fuel loss," he said. "I think the public is speaking up, and it's having a clear impact on public officials."

more than a negligible increase in consumer prices, would decrease domestic production, and would adversely affect local economies and cost jobs, he suggested.

Nichols noted that they would: "We believe these proposals are antijobs, anticonsumer, and antienergy. They will depress investment in new domestic oil and gas projects, weaken the nation's energy security, and slow the economic recovery," he said in his written testimony. "In addition, the proposals jeopardize the jobs of millions of industry workers across the country in

a time when so many Americans are unemployed and economic recovery remains uncertain."

In written testimony, Kleemeier said, "The Obama administration's budget request would strip essential capital from new American natural gas and oil investment by radically raising taxes on American production. American gas and oil production would be reduced. It runs counter to the administration's clean energy and energy security objectives."

"We believe these proposals are antijobs, anticonsumer, and antienergy. They will depress investment in new domestic oil and gas projects, weaken the nation's energy security, and slow the economic recovery."
—J. Larry Nichols, American Petroleum Institute chairman

'More, not less'

Kleemeier told OGJ that he remains astonished at Obama administration statements that developing and producing less domestic oil and gas is in the nation's best interest. So, apparently, does Nichols. "I have never heard anyone, before the Treasury Department produced its Green Book, say that the United States produces too much oil and gas. Every president since Richard Nixon and before Barack Obama said we need to produce more, not less," he told the subcommittee.

But Krueger said the administration believes it is no longer enough to address US energy needs simply by finding more fossil fuels, and that dramatic steps toward becoming a clean energy economy must be taken. "The tax subsidies that are currently provided to the oil and gas industry lead to inefficiency by encouraging an overinvestment of domestic resources in this industry.... [The tax subsidies also] result in distortions within the industry by favoring investment in nonintegrated firms," he said in his written testimony.

"Tax provisions that encourage investment in a specific industry may be justified in cases where they address a positive externality associated with either production or consumption of certain goods. Private market decisions can be inefficient when market prices do not reflect the full social costs," the Treasury official continued.

Oil and gas prices, for example, do not reflect environmental harm caused by the release into the atmosphere of greenhouse gases associated with production, Krueger maintained. The price of oil also does not reflect risks associated with US dependency or the costs of traffic congestion, he said. "Tax provisions can address this problem by incorporating the social costs into the price of the resources," he said.

Removing federal tax preferences would have little adverse impact on oil and gas prices, production, and employment, Krueger said. "The relatively small share US share of global [oil] production means that any change in domestic production will have a limited impact on the world supply,...[which the Treasury Department estimates] would fall by less than one-tenth of one percent due to the elimination of these tax subsidies," he said.

Price impacts

Even if additional costs to domestic oil companies were fully passed on to consumers through higher gasoline prices, "which is highly unlikely because prices are set on the world market, the cost would be equivalent to less than 1¢/gal," Krueger indicated. He conceded that a change in domestic producer costs could cause production to move from US independents to domestic and foreign integrated oil companies, but added that total oil finding and lifting costs would rise by less than 2%.

"Of course, the increase in costs would not translate into a one-for-one decrease in production," he said. "Based on estimates of short and long-run supply elasticities, we estimate that the decrease in domestic production due to these proposals will be less than one-half of one percent, even in the long run." Oil production employment would fall by a similar percentage, he added.

Since gas is a North American instead of global commodity in the US market, Krueger said impacts from removing tax preferences would be larger, but still modest. Estimates by the Treasury Department's Economic Policy Office said the subsidies are equal to about 1% of total gas industry revenues over the last 2 years, suggesting that their removal would result in about a maximum 1% price increase, he said. Consumers probably would reduce demand by less than 0.5% as a result, he suggested.

"Over the long term, employment in the natural gas production and supply industry could change by an amount similar to the change in production. As in the case of oil, eliminating the distortionary influence of the tax preferences for gas will result over time in new jobs being created in other sectors," said Krueger. "And, like oil production, the natural gas industry is highly capital-intensive relative to the US economy as a whole, suggesting these tax subsidies are not effective means for domestic job creation."

He said policies that reduce US

*"To the extent that current tax subsidies for the oil and gas industry encourage the overproduction of oil and gas, they divert resources from other, potentially more efficient investments."***—Alan B. Krueger, assistant US Treasury secretary for economic policy**

dependence on oil, such as a carbon cap-and-trade system or investing in clean energy technologies, are more effective in reducing US vulnerability to an oil price shock and promoting energy security. "To the extent that current tax subsidies for the oil and gas industry encourage the over-production of oil and gas, they divert resources from other, potentially more efficient investments, and they are inconsistent with the Obama administration's goals to reduce GHG emissions and build a new, clean energy economy," he said.

Other observations

Subcommittee Republicans had reservations. "I worry about the impact on jobs in my state from raising taxes on oil and gas companies," said John Cornyn (Tex.), and the subcommittee's ranking minority member, Orrin G. Hatch (Utah) observed: "You can pour trillions of dollars into developing energy alternatives, but without oil and gas, we won't be economically competitive for decades."

Two other witnesses expressed views similar to Krueger's. "No one has made a credible case that subsidies are necessary," said Stephen P.A. Brown, a nonresident fellow at Resources for the Future. "The prices of oil and gas are high enough to attract investment. If production falls because incentives are repealed, prices will rise enough to attract investment."

Calvin H. Johnson, a law professor at the University of Texas at Austin, said, "Indeed, an increase in the price of oil and gas, if any, would help us conserve energy, and adjust to alternative energy sources and high energy prices in the future. The government should get out of the business of subsidizing oil and gas, especially via the tax system."

The two industry witnesses contended that the costs to the nation would be high. Nichols said, "The proposals will make it more difficult, and more expensive, to meet our country's energy needs; will undermine our goal of energy security; will reduce jobs, investment, and government revenues from our domestic energy sector; and frankly are punitive to an industry that represents a significant part of the US economy."

A sixth witness, Kevin Book, a managing partner at Clearview Energy Partners LLC, said Congress should especially consider unintended consequences when considering the proposals. "A deepwater production tax could push activity back, which would reduce revenues," he said.

Federal lawmakers should move carefully, Book said. "After all, at this point in our nation's economic history, it seems equally irrational to demonizing the taxes that will fund government operations as it does to demonize the fossil energy that will power our economic recovery," he said. ✦

Lawmakers moving toward compromise on House OCS bill

Nick Snow
Washington Editor

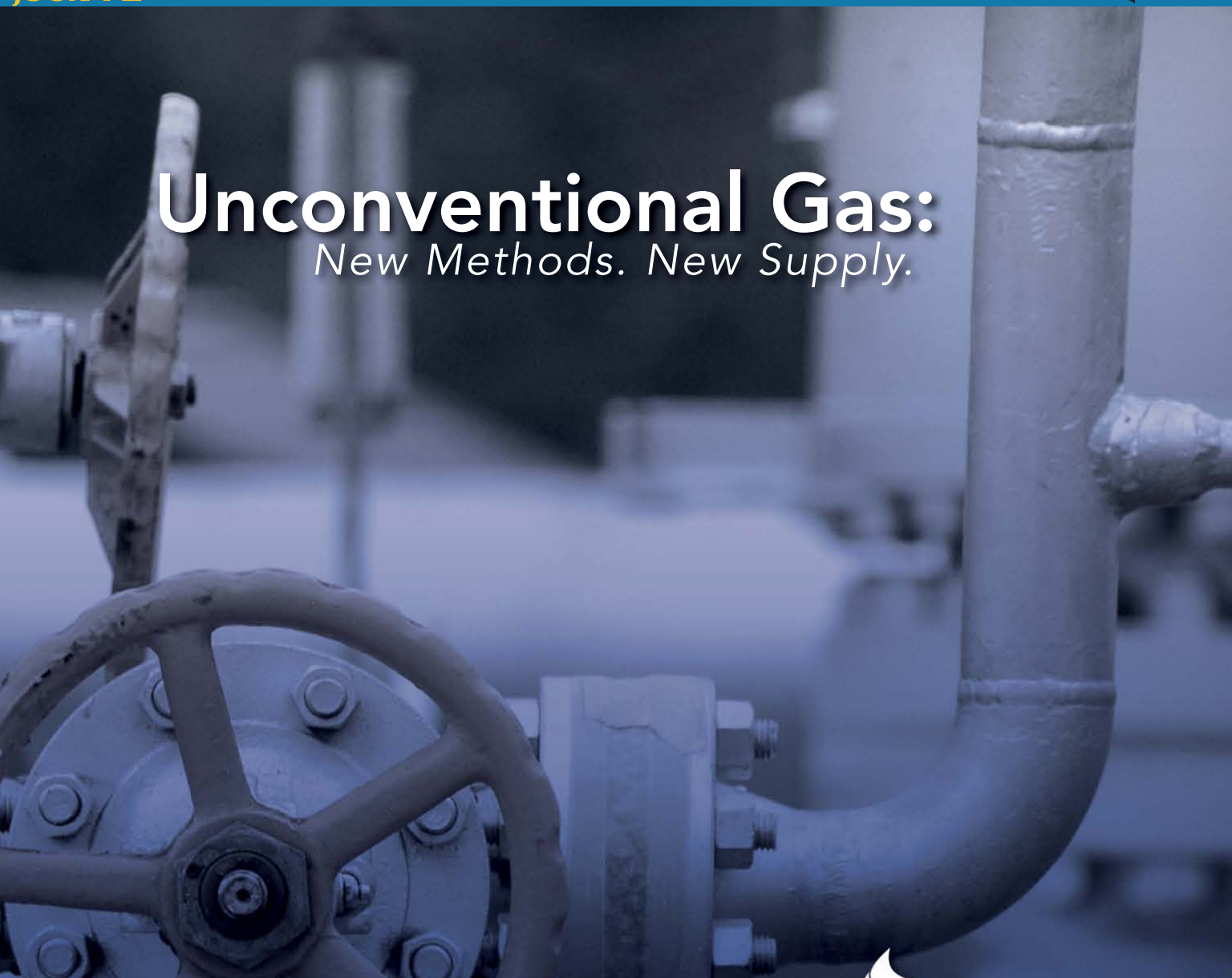
Responding to US House Natural Resources Committee Republican complaints that the Outer Continental Shelf bill he cosponsored with US Rep. Tim Murphy (R-Pa.) didn't go far enough, Rep. Neil Abercrombie (D-Ha.) said bipartisan compromises would be more productive than extreme positions.

Abercrombie dispensed with summarizing his prepared testimony during a Sept. 9 hearing by the committee's Energy and Mineral Resources Subcommittee on HR 2227 after Reps. Doug Lamborn (R-Colo.), the subcommittee's ranking minority member, and Doc Hastings (R-Wash.), the full committee's ranking minority member, said House Republican leaders' "all of the above" energy legislation was preferable.

"I consider this the most important hearing that's taking place today in terms of what Congress can do to stabilize this nation's economic future," said Abercrombie, who introduced HR 2227 with Murphy on May 4 and who also serves on the full committee. "This is the only bipartisan energy bill in this Congress. The Republican proposal that Mr. Lamborn and Mr. Hastings referred to isn't going to be considered."

Murphy said the bill, which includes a provision to use portions of new federal offshore oil and gas leasing revenues for energy conservation and research programs, would be the most ambitious energy and environmental bill in US history.

"And this legislation will be paid



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for: Developing our own resources will bring an estimated $2.2 trillion to $3.7 trillion in federal revenue. With this bill, we truly began the path toward a clean energy future by investing in clean energy, creating US jobs immediately and long into the future, [and] cleaning the environment, all without raising taxes," he maintained.

'More robust'

Following the hearing, the subcommittee's chairman, Jim Costa (D-Calif.), told reporters that he and the bill's 36 other cosponsors would like to talk to the full committee's chairman, Nick J. Rahall (D-W.Va.) about moving HR 2227 forward. Noting that Rahall on Sept. 8 announced his own energy bill, which would make major changes in the federal mineral leasing system, Costa said: "We think a more robust proposal has a better chance." He added that he also would encourage US Interior Sec. Ken Salazar to expedite a new 5-year OCS plan.

"Chairman Rahall knows about this bill's existence and our desire to move it forward," added Abercrombie, who was sitting nearby. "So far, our talks have been collegial."

In addition to distributing $440 billion, or 20%, of projected new federal OCS revenues to a renewable energy and energy efficiency reserve for research and development, HR 2227 would send $660 billion, or 30%, to producing states which work with the federal government to allow exploration and production of offshore resources; $220 billion, or 10%, to fund clean coal technology and carbon capture and sequestration research; $220 billion, or 10%, to an environmental restoration reserve; and $220 billion, or 10%, for the general federal treasury.

A further $176 billion, or 8%, would go to a conservation reserve; $110 billion, or 5%, to a carbon-free technology deployment and nuclear energy reserve; $110 billion, or 5%, to a clean water reserve; and $44 billion, or 2%, to the Low Income Home Energy Assistance Program (LIHEAP).

The measure also would approve the 2010-15 OCS plan and expedite reviews; expedite lease sales; extend coastal states' boundaries from three to a uniform 12 nautical miles, providing jurisdiction for state royalty payments within the 12 miles; establish an expedited inventory of offshore energy resources; repeal the ban on oil and gas development within 125 miles of shore in the eastern Gulf of Mexico; and establish procedures to expedite judicial reviews of oil and gas leases.

'Aren't in stone'

When Hastings asked Abercrombie if he would object to HR 2227's being offered as a substitute to Rahall's or another House Democratic energy bill, Abercrombie said he would not. But he also urged House Republican leaders to join the working group for his and Murphy's bill and present ideas from their own plan.

"The members who worked on this bill didn't agree to every provision, but they kept working on it. The numbers aren't written in stone," he said. Attaching HR 2227 to other legislation also would be acceptable, he added.

It's imperative for Congress to pass an energy bill, Murphy said. "I don't want to repeat the mistakes of the 1970s, when oil prices went down and America went back to sleep. Members of [the Organization of Petroleum Exporting Countries] want oil back at $90/bbl soon and $200/bbl within 2 years," he said. The US should continue pushing for efficiency, conservation, and alternatives and developing more of its domestic oil and gas resources, he maintained.

Speaking with reporters, Murphy said the bill's core working group involved six to eight House members and their staffs, with input from several other members. Responding to Hastings and Lamborn's suggestions that the bill falls short of what is needed, the Pennsylvanian said: "This bill has so many elements in it I'd be hard-pressed to think of what's been left out. But we're one oil embargo away from economic catastrophe. Being too dogmatic just leads to a big coughing session."

Responding to Costa's question about what Abercrombie thinks the Obama administration's energy policy approach is, the member from Hawaii replied: "I see a policy that's trans-Cabinet" with the energy and interior secretaries and Environmental Protection Agency administrator working together under the direction of Carol M. Browner, White House coordinator of energy, environmental, and global climate change policy.

He also suggested that, as others in Washington concentrate on health care and overall economic issues, recognition is growing in Congress that nonpartisan, constructive energy legislation needs to be passed. "Every day, we get more information that something needs to be done, that we can't keep sending billions of dollars overseas, and that this country needs to use all technologies to be energy-independent," he said following the hearing.

Other witnesses

Two witnesses on a second panel presented contrasting views. Doug Morris, the American Petroleum Institute's upstream and industry operations director, reiterated API's position that the nation needs a balanced, fact-based energy policy promoting efficiency and conservation and greater supplies of all forms of energy, including oil and gas. "Passage of this legislation would mean new jobs; more revenues for cash-strapped local, state, and federal governments; and greater energy security for our country," he said.

Athan Manuel, the Sierra Club's lands protection program director, said the environmental organization supports most of HR 2227's provisions but opposes oil and gas activity on the OCS where it is not taking place already. He said wind power would be better, prompting Lamborn to suggest that the Sierra Club's own estimates project that 300,000 windmills, or 166 for every mile of shoreline, would be required to fully realize wind energy potential

off the East Coast. Manuel responded that the number probably would be less as the wind energy industry develops more efficient technology with smaller windmills and uses floating, instead of fixed-leg, production platforms.

Several organizations said they were pleased that the subcommittee held the hearing, which more Republicans than Democrats attended.

"While some of the debate in Washington continues to focus on how to discourage domestic oil and gas production, through burdensome federal regulations and even higher taxes, today's hearing was an honest, forthright, and energizing discussion about the role that affordable, available energy will continue to play in our economy," said Independent Petroleum Association of America Pres. Barry Russell. "It is encouraging that Democrats and Republicans are coming together, joining hands, and working to end the ban on offshore energy production."

David Holt, president of the Consumer Energy Alliance, called the hearing timely. "In less than 2 weeks, the Interior Department's public comment period regarding the upcoming 5-year OCS plan will close, and the fate of domestic energy production for the next several years, and possibly well beyond that, will in part be determined," he said.

Thomas J. Pyle, president of the Institute for Energy Research, said he hoped the hearing sent a message to Salazar. "If we are to remain competitive in a highly competitive global economy, we cannot continue to turn our backs on America's energy," he said. "Instead of putting up endless roadblocks to energy production, the Obama administration should be standing shoulder to shoulder with these responsible policymakers." ✦

Senate Energy panel weighs cap-and-trade alternatives

Nick Snow
Washington Editor

US Senate Energy and Natural Resources Committee members appeared ready to consider cap-and-trade alternatives as they began their 2009 climate-change hearings on Sept. 15.

"The search for effective legislative proposals for avoiding climate change involves avoiding the costs of global warming without imposing other unintended costs that would have few benefits and could even have negative impacts on society," committee chairman Jeff Bingaman (D-NM) said in his opening statement. "We need to provide assurances that the costs of a cap-and-trade system will not go out of control, either through excessive prices or excessive volatility."

Republicans criticized a climate-change bill, which included a cap-and-trade program, that the US House passed on June 26. "Having done something on climate change is not the same thing as having done it right," said Lisa Murkowski (R-Alas.), the ranking minority member. She said, "The Senate debate should not be about more than who will receive free emissions allowances, but about how we can truly address climate change in a transparent and economically sound manner."

Other GOP members said the committee should be wary of the House bill cosponsored by Reps. Henry G. Waxman (D-Calif.) and Edward J. Markey (D-Mass.). John Barrasso (Wyo.) said after the hearing that it could result in a "green collar" crime wave. "This is Enron, Part II; another Wall Street Ponzi scheme dreamed up by bankers and brokers," Barrasso said.

Democrats expressed their own concerns. "I have great problems with the 'trade' side of cap-and-trade," said Byron L. Dorgan (D-ND). "The discussion today of a price collar demonstrates a lack of confidence in the market. We're heading toward creating a $1 trillion securities market with a diminishing product."

Range of alternatives

Five witnesses discussed cap-and-trade and alternatives including a carbon tax and price floors and ceilings, or collars, for carbon emissions commodities. They generally suggested that federal lawmakers will need to consider both environmental and economic aspects as they develop final legislation.

"A critical policy decision that one is faced with in determining any appropriate cost containment mechanism is whether maintenance of the program's overall [emissions] cap is paramount, or whether there are conditions under which economic or energy policy concerns may mandate a change in the reduction system, at least temporarily," said Brent Yacobucci, an energy and environmental policy specialist at the Congressional Research Service.

Referring to the Waxman-Markey bill, Joseph R. Mason, a finance professor at Louisiana State University, said, "Inappropriate auditor behavior is all too familiar. There are considerable holes in any 1,400-page document. I believe there's a risk in climbing into any cap-and-trade system without closing those holes."

Other committee members and witnesses suggested that it will be equally important to establish a price floor as well as a ceiling in any new carbon market. "If you set the [carbon emissions market] price too low, you lose the climate benefits. If you set it too high, you face economic risks," said Eileen Claussen, president of the Pew Center on Climate Change.

'Additional uncertainties'

"We need both," said Sen. Debbie Stabanow (D-Mich.). "From my perspective, it makes sense to have

WATCHING GOVERNMENT

Nick Snow, Washington Editor

Blog at www.ogjonline.com

CFTC's role in cap-and-trade

The US Commodity Futures Trading Commission expects to actively participate in any federal carbon cap-and-trade regulation, CFTC Chairman Gary G. Gensler told a US Senate committee on Sept. 9.

The commission should be ready because it already has experience regulating in three of the five broad regulatory components he believes would comprise a US cap-and-trade regime, Gensler said in testimony to the Senate Agriculture, Nutrition, and Forestry Committee.

"Over the past year, we have witnessed the consequences that regulatory gaps and inconsistencies can have on our financial system, the economy, and the American people," he said. "As Congress moves forward with potential cap-and-trade legislation, I believe it should ensure that there is a comprehensive regulatory framework over the expanded carbon markets, both the futures market and the cash market, without exception."

Effectively regulating carbon allowance trading will require several regulators' cooperation, Gensler said. The effort will need to involve standard setting and regulation, record-keeping (including maintaining a registry), trade execution system oversight, clearing of trades oversight, and protection against fraud, manipulation, and other abuses, he said.

Regulating trade

The first two components fall within other agencies' expertise because they "are better equipped to regulate the 'cap' part of 'cap-and-trade'," Gensler told the committee. But the agency has broad experience in the three other areas, he said.

"The commission already oversees trading and clearing of futures and options contracts based on sulfur dioxide, nitrogen oxide, and carbon dioxide allowances and offsets listed on the New York Mercantile Exchange and the Chicago Climate Futures Exchange [CCX]," said Gensler.

In August, Gensler said, under authority it received in last year's Farm Bill, the commission sought public comment on possibly classifying the carbon financial instrument contract traded on the CCX as a significant price discovery contract.

'Abundant experience'

Gensler added that the CFTC has "abundant experience" regulating centralized marketplaces and would be well-suited to regulate cash markets for emissions instruments if Congress desired.

"The emissions trading markets that the CFTC currently regulate are small relative to the expected growth of the carbon market as a result of cap-and-trade legislation. Still, the agency has the expertise to apply the same oversight to the much larger, national and mandatory market," Gensler said.

The agency would need more money to expand its staff and implement technology to oversee new carbon markets, he warned. CFTC is only now getting back to its staffing levels of the late 1990s, which were cut by 20% as markets grew fivefold and contract volumes climbed sixfold, he said.

But Gensler said his agency could do the job. ✦

offsets. If we were to look at completely eliminating them in favor of only a price collar, there would be additional uncertainties."

"Part of setting up a cap-and-trade system is establishing a market, which is the best mechanism for setting prices," said Jeanne Shaheen (D-NH). "The question then becomes how to avoid volatility and interference."

"A price collar is the kind of intervention we want because it would be beneficial," said Jason Grumet, president of the Bipartisan Policy Center. But another witness, Michael Wara, an assistant professor at Stanford University's law school, said that a price floor also matters. "The key to having a price floor is to have something for innovative firms to take to potential investors. Without one, financial markets set the [carbon] price at zero," he said.

Witnesses also discussed international offsets in cap-and-trade programs, which apparently primarily involve restraining deforestation. "Where I come from in Louisiana, we're grinding up new-growth cypress wood into pellets for shipment overseas so factories in the European Union can meet their carbon emissions reduction goals," he said. "Where is the sense in that?"

The hearing was the first of two on global climate change issues that the committee scheduled during the week. The second was held on Sept. 17. ✦

GAO says MMS may be forfeiting millions in RIK gas revenue

Nick Snow
Washington Editor

The US Minerals Management Service may be forfeiting millions of dollars in natural gas royalties under its royalty-in-kind (RIK) program because it apparently isn't identifying and collecting on imbalances, the Government Accountability Office said.

The MMS, part of the Department of the Interior, estimates that it is owed $21 million for past imbalances but says it lacks the information to calculate the full amount due, GAO said. "MMS does not have sufficient data to determine whether it received its full percentage of RIK gas," it added.

GAO released the assessment 2 days before US House Natural Resources Committee hearings on legislation Chairman Nick J. Rahall (D-W.Va.) introduced on Sept. 8 that would restructure the federal minerals oversight system. The bill would eliminate the RIK program.

GAO's report said MMS's estimate does not include interest on some unpaid amounts because the agency has not determined when interest begins to accrue, as required by law.

"Further, MMS monitors imbalances on a monthly, rather than daily, basis, which leaves open the possibility that some companies owing RIK gas could provide less to MMS when prices are relatively high, making up the difference when prices are relatively low," it continued. "[This] could cost MMS additional revenue because it could miss the opportunity to sell gas on the days when prices are high."

Failure to audit

GAO said MMS can't verify that it is receiving its entitled percentage of gas because it does not audit companies' production and allocation data, in part because it considers its own verification procedures sufficient.

The agency's information system does not provide accurate and timely gas imbalance data, GAO's report said. "For instance, MMS's information system cannot calculate cash settlements for imbalances or compare various types of data that companies submit. Consequently, MMS processes more than half of its gas imbalance data manually," it said.

The report noted that MMS has operated for several years without enough employees to reconcile gas imbalances, and those it has are insufficiently trained.

"According to RIK management, MMS does not have sufficient staff to dedicate someone to fully review RIK gas analysts' work on imbalances, even though mistakes in that work often occur," it continued. "MMS recently hired one new gas imbalance analyst but has not formally assessed staffing needs. In addition, RIK gas imbalance staff lack, among other things, training on industry standards on gas imbalance calculations."

The report recommended that the interior secretary direct MMS to establish policies to appropriately value outstanding RIK gas imbalances and promptly collect the amounts, begin to monitor gas imbalances daily, audit operators and imbalance data on a sample of leases to establish a risk-based audit program for RIK properties, and determine the information and personnel additions necessary to make the program more effective. ✦

Rahall introduces major federal mineral policy reform bill

Nick Snow
Washington Editor

US House Natural Resources Committee Chairman Nick J. Rahall (D-W. Va.) introduced a major federal minerals policy reform bill on Sept. 8. Its provisions include consolidation of the US Minerals Management Service and Bureau of Land Management.

HR 3534 also would eliminate the royalty-in-kind program and federal reimbursement on interest accrued on overpayments a lessee erroneously makes, raise onshore rental rates for the first time since the 1980s, require new rules to ensure diligent development of leases, and assess a fee on existing leases that are not producing oil and gas, according to the committee majority's summary of the bill.

The committee will hold hearings on Sept. 16-17 to discuss the measure, Rahall said on Sept. 10. He added that US Interior Secretary Ken Salazar and representatives from the US Department of the Interior Inspector General's Office and the Government Accountability Offices are expected to testify, along with representatives from energy industries, environmental organizations, and other stakeholders.

"Last year, upon lifting the moratorium on oil and gas drilling in the Outer Continental Shelf (OCS), Americans were handed an opportunity to explore the vast potential of our public energy resources in offshore waters," said Rahall. "This legislation lays the groundwork to ensure those resources are developed as efficiently and expeditiously as possible so that domestic oil and gas can begin flowing from those newly opened areas."

Doc Hastings (R-Wash.), the committee's ranking minority member, attacked the measure at a Sept. 9 hearing as "a big government bill that throws up more bureaucratic roadblocks on the path to American energy production and job creation. Instead of pushing to open additional areas for drilling, Democrats are raising fees and taxes, ballooning government bureaucracy, rolling out more red tape, and delaying greater wind, solar, oil and natural gas production."

His remarks came at the opening of the committee's Energy and Mineral Resources Subcommittee hearing on HR 2227, an OCS bill that Reps. Tim Murphy (R-Pa.) and Neil Abercrombie (D-Ha.) introduced on May 4. Hastings and Doug Lamborn (R-Colo.), the subcommittee's ranking minority member, said that this measure falls short of the House Republican leadership's so-called "all of the above" energy bill.

WATCHING THE WORLD

Eric Watkins, Oil Diplomacy Editor

Blog at www.ogjonline.com

Romania's on the map

Romania's oil and gas industry is beginning to turn some heads these days, with an international energy conference scheduled for Sept. 30-Oct. 2 and new production commencing offshore.

With a host of prominent speakers lined up, next week's Black Sea Energy & Economic Forum looks to be a major focal point for high-level discussion about the region and its place on the world energy map.

Among the initial speakers are Romanian President Traian Basescu, US Sen. Chuck Hagel, Chairman of the Atlantic Council, Ambassador Richard Morningstar, US Special Envoy for Eurasian Energy, and Eni SPA Chief Executive Paolo Scaroni.

It looks to be an informative occasion especially given the hopes for the region's oil and gas, to say nothing of the politics which, in the past, have sometimes hindered their development and export to world markets.

SOCAR interested

Other interests are meanwhile eyeing Romania, including the State Oil Co. of the Azerbaijan Republic (Socar), which continues to show interest in refining in the country. "This issue is on the agenda, and it is attractive enough," said one Socar official.

In Romania, all refineries are private, he said, so negotiations can be conducted only with private entrepreneurs. "This requires a long period of negotiations and evaluation," the official said.

As those negotiations get under way—or not—Romania's largest oil company Petrom started production at its recently drilled Delta 6 and Lebada Vest wells on Histria XVIII block in the Black Sea.

According to Petrom, the production of the two new wells together accounts for 10% of Petrom's daily offshore production.

"This recent production start-up on Delta field is a great achievement, taking into consideration the technical difficulties we have experienced during drilling Delta 6," said Johann Pleininger, Petrom executive board member responsible for exploration and production.

Extended reach

"As the concept of extended reach drilling has proved to be successful, Delta 6 might become our most valuable well in Romania," Pleininger said.

Petrom is currently operating five producing commercial fields: Lebada Est, Lebada Vest, Sinoe, Pescaru, and Delta. The country's offshore production stands at 32,000 boe/d or about 18% of Petrom's domestic production.

Word of the new offshore production will be welcomed in the country, especially given recent reports that Romania's energy output fell by 7.7% on the year in the first 7 months of 2009, while imports decreased by an annual 39.3%.

According to the National Statistics Institute, Romania's energy production totaled 13.277 million tonnes of oil equivalent (toe), while imports reached 5.960 million toe through July.

Romania saw a 6.7% decrease in its production of oil to 2.413 million toe. ✦

OPEC sees world oil demand to rise in 2010

Eric Watkins
Oil Diplomacy Editor

The Organization of Petroleum Exporting Countries, standing by an earlier forecast, predicted that world oil demand will decline slightly in 2009 but will resume growing in 2010.

In its September report, OPEC said world oil demand in 2009 would contract by 1.56 million b/d to 84.05 million b/d. Last month, OPEC said that the contraction would be slightly larger at 1.65 million b/d for this year.

However, reiterating a figure it used in last month's report, the group said, "In 2010, global demand is forecast to return to growth following 2 years of consecutive declines, increasing 0.5 million b/d to stand at 84.6 million b/d."

According to OPEC, "The US is playing a significant role in world oil demand, showing a comeback and reducing the contraction from 0.7 million b/d in July to almost flat in August."

OPEC attributed the comeback in the US to "improved economic activity, summer driving consumption, and the low base in the same month of 2008."

It also said oil demand is strong in developing countries such as China, India, and the Middle East. It predicted that those same regions would remain the driving force behind world oil demand growth next year.

"As seen in recent years, most of the growth will take place in non-OECD [Organization for Economic Cooperation and Development], mainly China, India, the Middle East and Latin America," the OPEC report said.

It said that overall, "in anticipation of a slow economic recovery next year, world oil demand growth is expected at 500,000 b/d." ✦

Exploration eyed in Arizona's Holbrook, Great Basin areas

Alan Petzet
Chief Editor-Exploration

Exploration is planned in eastern and northwestern Arizona in the Holbrook basin and in a subbasin of the Basin and Range Province.

An oil, gas, and helium exploration program with capital spending of as much as $29 million is on tap in eastern Arizona's Holbrook basin.

And explorers will look for oil and gas in northwestern in Arizona southeast of Las Vegas, Nev., in a subbasin west of Kingman.

Both programs involve acreage farmed out from PetroSun Inc., Scottsdale, Ariz.

Arizona's oil and gas production comes from Dineh-bi-Keyah field and several small fields in northern Apache County in the Four Corners area.

June's production totaled 4,126 bbl of oil, 93% of which is from Dineh-bi-Keyah, and 58.8 MMcf of gas, 73% of which came from the large field.

Arizona, which also has produced helium in the past, has produced no carbon dioxide since July 2003.

A commercial discovery in the Holbrook or Sacramento areas would breathe new life into exploration in the state.

Holbrook exploration

PetroSun signed a deal with Energy Southwest LLC, also of Scottsdale, that contains a drilling and development obligation under which Energy Southwest will explore PetroSun's 985,000 acres in the Holbrook basin.

The first exploratory wells will be drilled on the Manuel Seep and Meteor Crater prospects.

The Manuel Seep well, 35 miles south of Holbrook, will be drilled to basement at roughly 4,600 ft to test all prospective oil, natural gas, and helium zones.

The Meteor Crater well, 8 miles east of Meteor Crater road, will be a direct offset to the Holbrook Energy 26-1 well that discovered an oil-bearing sand in the Fort Apache member of the Permian Supai formation at 1,632-44 ft. The Meteor Crater offset will test the Fort Apache for potential commercial crude oil production, PetroSun said.

State records show the well, in 26-19n-13e, Coconino County, close to the famed astrobleme feature about midway between Flagstaff and Holbrook, was reentered, tested, and plugged in October 2004. Townsend Oil first drilled it in 1995.

"The agreement with Energy Southwest allows PetroSun to test the Holbrook basin structures for commercial oil, natural gas, and-or helium reserves and will provide the company with the means to retire our outstanding debt," said Gordon LeBlanc Jr., PetroSun chief executive officer.

Sacramento Valley

Forest Gate Energy Inc., Montreal, signed an agreement to acquire a 70% equity interest in all Arizona oil and gas leases held by Vanterra Energy Inc., a private Calgary firm.

Arizona's current oil and gas production comes from Dineh-bi-Keyah field and several small fields in northern Apache County.

On completing the deal, Forest Gate would issue to Vanterra 2.69 million Forest Gate common shares, 5.25 million subscription receipts convertible into Forest Gate common shares without further consideration, and 7.3 million warrants at an exercise price of 25¢/share. The warrants would expire on the second anniversary of issuance.

Vanterra is owned by Don Vandergrift, a Calgary petroleum engineer. The company targets oil in the Sacramento Valley Neogene subbasin generally west of Kingman, Ariz., part of the multistate Basin and Range Province.

Forest Gate noted that the Railroad Valley Neogene subbasin of the Basin and Range Province in Nye County,

Nev., 250 miles northwest has produced more than 42 million bbl of oil.

Forest Gate and Vanterra plan to drill an 11,000-ft well targeting Jurassic Navajo sands at 6,000 ft, Mississippian carbonates at 9,160 ft, and Devonian carbonates at 10,160 ft. They chose a drillsite based on a seismic program acquired by Phillips Petroleum Co. in 1981 and later licensed to Vanterra.

Vanterra ran geochemical and geoelectromagnetic surveys covering 50 stations over the southern part of the prospect area in 2008.

Geochemical sampling tested for methane, ethane, propane, butane, ethylene, and propylene and confirmed an active hydrocarbon system in the vicinity. The geoelectromagnetic survey consistently showed direct hydrocarbon indicators at depths consistent with interpreted depths for Devonian and Mississippian carbonates, Forest Gate said.

The area is accessible for drilling equipment and has been approved for drilling by federal and state land agencies.

The Mohave County holdings include 100% interest in 7,800 acres of federal land with a 10-year term ending in July 2017, 100% interest in 3,200 acres of state lands with a 5-year term ending in February 2012 and renewable by request, and 90% interest in 12,800 acres of freehold lands with a 5-year term ending in August 2011 and renewable by request.

Vanterra is negotiating for a further 10,784 acres of freehold minerals. ✦

ConocoPhillips, Lane to explore Polish shale gas

3Legs Resources PLC unit Lane Energy Poland has signed an agreement with ConocoPhillips for joint evaluation of Lane's six Baltic basin licenses covering 4,000 sq km in Poland.

Lane said ConocoPhillips will fund an initial shale gas exploration program of seismic and drilling. A 3D seismic program was started in July and the parties intend to spud a first well in the first quarter of 2010.

Lane Energy Poland will act as operator on the initial phase. ConocoPhillips will have the right to acquire a majority equity interest in the concessions, which lie in northern Poland in the Baltic basin region near the Port of Gdansk.

"Our assessment of the reservoir potential, based on independent testing of core samples and review of historical well log data, is extremely encouraging," Lane said.

Lane said its agreement with ConocoPhillips represents "a landmark transaction for the 3Legs Resources Group, which it believes will enable it to maximize the potential of its Baltic basin licenses."

Larry Archibald, ConocoPhillips's vice-president of exploration, told the Barclays Capital energy conference that the agreement with Lane Energy gives ConocoPhillips the option to earn 70% and operate up to 1 million acres.

Archibald added that the acreage in northern Poland is flat, easy to reach, and any natural gas produced can go into the European Union market, which has good demand.

Analyst BMI also gave an upbeat assessment to the agreement: "Should commercial volumes of gas be proven, we could also see an improvement in Poland's energy security situation."

The analyst noted that Poland has recently been attempting to secure "a long-term supply deal with Moscow but has run into difficulties after Russia contested the ownership structure of the Yamal-Europe pipeline operator EuRoPol Gaz."

As part of its effort to produce gas domestically, Poland's environment ministry last December awarded ExxonMobil Corp. two 5-year exploration licenses to search for gas in the Mazowieckie and Lubelskie provinces, in the eastern and southeastern areas of the country.

The first concession covers a 1,200 sq km area near Wolomin, northeast of Warsaw. The second covers a 1,000 sq km area near Zamosc in southeastern Poland.

Poland has 5.8 tcf of proved gas reserves and produces 4.3 billion cu m/year or 31% of domestic consumption via state Polish Oil & Gas Co. BMI forecasts Polish gas production to rise to 4.8 bcm in 2009 while consumption will rise to 13.8 bcm. ✦

Newfield Exploration sees commercial project off China

Newfield Exploration Co., Houston, has established more than 30 million bbl of recoverable oil worth a commercial development on 510,000-acre Block 16/05 east-southeast of Hong Kong in the Pearl River Mouth basin off China and sees several years of active drilling.

The LF 7-1 well tested an equipment-limited 6,000 b/d of 35° gravity oil from a single zone. An offset to Newfield's 2008 LF 7-2 discovery, it was drilled to test a downthrown anticline.

Success at LF 7-1 set up a deeper oil prospect in the same fault trap that Newfield may test in 2010 by drilling a downdip sidetrack. LF 7-1 went to a total depth of 10,000 ft in 350 ft of water and cut more than 75 m of high-quality oil pay in multiple sands.

Newfield expects to start production from the block in 2012.

"We are very encouraged by this discovery and its implications for our remaining prospects on this block and we expect an active drilling campaign here over the next several years," the company said.

Newfield shot 200 sq km of 3D seismic in 2007 to better assess the structural complex. It identified numerous independent untested structures analogous to this discovery. For example, the LF 7-6 structure 15 km northeast is to be drilled in 2010.

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China National Offshore Oil Corp. has the right to participate in any development with a 51% interest.

Meanwhile, Newfield will accelerate by 6 months Phase II development drilling at East Belumut oil field in PM 323 off Malaysia.

It will drill three development wells in late 2009 and three more in early 2010 from the existing production platform at a cost of $36 million to hike 2010 oil production by 1 million bbl net. Newfield operates PM 323 with a 60% interest. ✦

BLM begins scoping period for EOG Uinta gas project

A 30-day public scoping period for a large natural gas infill project proposed by EOG Resources Inc., Houston, in eastern Utah began on Sept. 9, the US Bureau of Land Management's Vernal, Utah, field office announced. It previously postponed the scoping period and an associated public meeting temporarily on Jan. 28.

BLM said the Greater Chapita Wells Natural Gas Infill Project would involve 40,027 acres in Uintah County about 30 miles southeast of Vernal and 12 miles east of Ouray. It said EOG has proposed to drill 7,028 wells from 700 new well pads and 979 existing well pads, which would be expanded to accommodate the new Uinta basin wells.

"The number of new wells represents a conceptual maximum development scenario as determined by EOG's evaluation of producible reserves from known reservoirs," BLM said in its scoping notice. The area is part of giant Natural Buttes gas-condensate field.

It said it has determined that giving permits to the proposed project would constitute a major federal action potentially affecting the environment. The US Department of the Interior agency said it plans to prepare an environmental impact statement as a result.

It is seeking public involvement during the 30-day scoping period to identify issues of concern, determine how much analysis is necessary to address issues in the EIS, identify possible mitigation measures, and identify reasonable alternatives.

BLM said it would accept comments on the proposed project through Oct. 9. It said that its Vernal field office will also host a public meeting Sept. 29 at the Utah Field House Museum of Natural History in the eastern Utah community. ✦

India

India's Directorate General of Hydrocarbons let a contract to Spectrum ASA, Oslo, to reprocess 10,100 line-km of 2D seismic over the Andaman Islands frontier off eastern India.

Eight blocks off the islands are offered in the NELP VIII license round that closes Oct. 12, and Spectrum will make the reprocessed data available to third parties.

Ivory Coast

Vanco Energy Co. let a contract to OHM Group subsidiary Rock Solid Images for a 2,000 sq km seismic reservoir characterization project off Ivory Coast. Vanco Energy and Rock Solid Images are Houston firms.

Vanco Energy said the study is an extension to the successful and recently completed prestack seismic inversion projects conducted by Rock Solid Images over the Orca and Baleine prospects. It also builds on the ongoing prestack seismic inversion of the Bassam Canyon prospect.

Rock Solid Images will characterize potential reservoir facies and reservoir properties for a prospective area that warrants additional research.

Vanco Energy is working with 1,029 sq km of 3D seismic it shot in late 2007 on blocks CI-101 and CI-401, west of and on trend with large deepwater oil discoveries off Ghana.

Nicaragua

Infinity Energy Resources Inc., Overland Park, Kan., licensed 2D seismic data from Fugro Data Services AG on Infinity's oil and gas concessions in the Caribbean off Nicaragua.

Processing of the data is to be complete in 60-90 days, after which Infinity will be able to more fully engage in talks with potential exploration and development partners on the 1.4 million acres of holdings.

Syria

Groundstar Resources Ltd., Calgary, agreed to a request from Syria's Ministry of Petroleum & Mineral Resources to return blocks XIV and XVI awarded to Groundstar in April 2008.

Groundstar collected and interpreted 4,600 line-km of legacy 2D seismic and related well information on and adjacent to the blocks and identified several leads but was unable to secure a partner due to a large work program in a tight credit market with global financial uncertainty. Groundstar said it remains in good standing with the ministry and will participate in upcoming bid rounds for exploration blocks and enhanced oil recovery projects.

Oklahoma

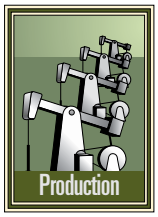
Continental Resources Inc., Enid, Okla., said it controls 117,000 net undeveloped acres in the Anadarko basin Woodford shale play, where it plans much more drilling.

A recent completion, Young 2-22H, in Blaine County, Okla., averaged 6.8 MMcfd of gas for 7 days from a 4,952-ft lateral stimulated with 10 frac stages. The well went to TD 18,633 measured depth, 13,685 ft true vertical depth. Continental's interest is 55%.

Continental's acreage spread extends from McClain County on the southeast to Dewey County on the northwest.

Steam distillation effects improve thin, light-oil reservoir recoveries

Hongling Zhang
Huiqing Liu
Renjing Liu
China University of Petroleum
Beijing



A study has shown that steamflooding distillation effects would improve crude recovery from thin reservoirs with less viscous crude.

Steam distillation means that steam injection will cause some volatile components of the crude to enter a vapor phase.

At present, the industry mostly uses steamflooding for exploiting heavy oil reservoirs. In recent years, however, some interest has been shown in using steamflooding for recovering crude from thinner reservoirs containing lighter crudes.[1,2] One example of a successful application was a reservoir in the NPR-3 oil field in Wyoming.

The reservoir was first developed in 1922, but its primary recovery was only 5%. In 1985, steam injection started in the reservoir and by the end of 1996 the recovery had increased to 13.5% of the oil in place.[3]

Distillation effects

Steam distillation in porous media is an important mechanism in steamflooding, especially for thin oil reservoir.[4,5]

Our study showed that steam distillation of crude is not the major mechanism during steamflooding of heavy oil reservoirs and it can be ignored when crude viscosity is greater than 1,000 cp. But for steamflooding in thin, light-oil reservoirs, steam distillation of the crude becomes an important mechanism, contributing about 30% of the recovery.

The distillation effect depends mainly on crude oil properties, and reservoir temperature and pressure. In normal cases, the distillation effect is more pronounced with a lower formation pressure.

Steamflood recovery improves when the reservoir has higher remaining oil saturation after a conventional waterflood. Therefore, it is favorable to start steamflooding at an earlier stage.

The favorable effects of steam distillation include:[6]

- Decrease in flow resistance because of a lower gas viscosity.
- Formation of a solvent drive in the frontal zone.
- Transfer of light components in dead-end pores to the connected pores.
- Reduction in crude oil viscosity by self-dilution.

During steam injection, the evaporation pressures of crude oil and water increase with increasing temperature.

Oil properties

Table 1

Formation	Well No.	Density, g/cc	Viscosity, cp at 50° C.	Wax content, %	Colloids and asphaltenes, %	Pour point, °C.
III6	L71219	0.9473	1,175.78	18.72	17.88	29
IV2	L7515	0.9736	5,291.36	13.34	30.85	10
IV3	L7802	0.939	487.15	28.01	16.32	–6
IV5	LJ7011	0.941	327.03	15.56	14.08	10
IV7	LJ7306	0.9643	2,336.88	3.62	23.06	4

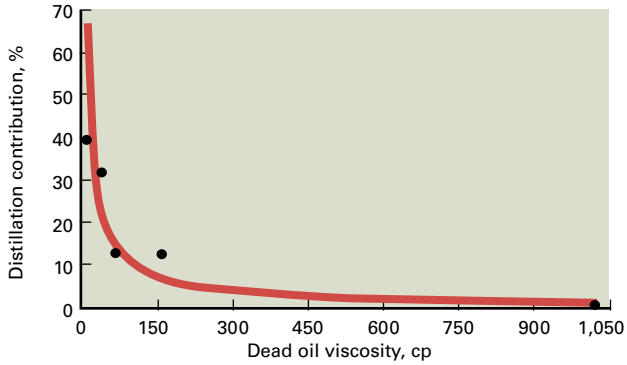
Pseudocomponent properties

Table 2

Component	Density, g/cc	Molecular weight	Critical temperature, °C.	Critical pressure, MPa	Equilibrium constants KV1	KV3	KV4	KV5
Light	0.821	245	90	3.550	5.79×10^9	1.23×10^6	–8.906	–273
Medium	0.903	440	250	1.965	1.07×10^6	212	–2,240	–6.7
Heavy	0.976	600						

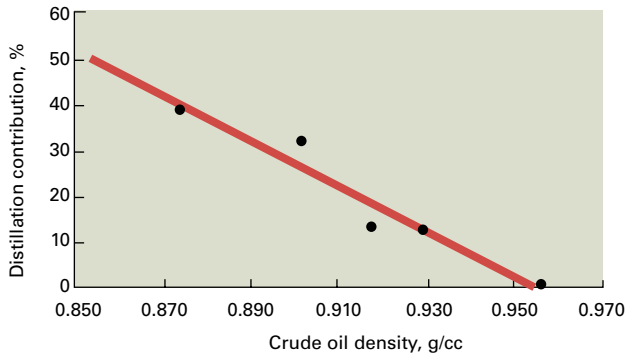
OIL VISCOSITY EFFECT

Fig. 1



OILLATION CONTRIBUTION, %

Fig. 2



When the vaporization pressures of oil and water are equal to the local reservoir pressure, the light components of crude oil will vaporize into a gaseous phase.

Simulation model

Our reservoir model used Block 7 of the Jinglou reservoir in Henan oil field as an example. The block had an initial oil in place of 280 million tonnes, and the main oil-bearing series is the third member of the Hetaoyuan formation, at a depth of 200-900 m.

The reservoir has a 30° C. temperature and a 1.0 formation pressure coefficient.

The thickness of a single layer is 1-4 m and the combined thickness is 3-10 m. The reservoir has a 0.65 net-to-gross ratio and a 75% initial oil saturation.

The reservoir contains a rock with a strong hydrophilic wettability, a 27.2-33.1% porosity, and 723-2,231 md permeability.

In general, the reservoir has good properties but with severe heterogeneity.

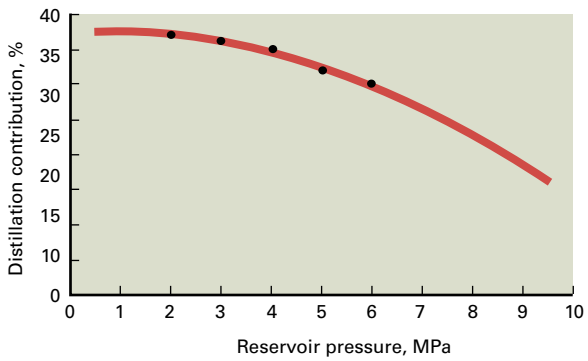
Table 1 shows the oil properties of five wells in Block 7 of Jinglou reservoir.

Our study involved dividing the crude oil into three pseudocomponents—light, middle, and heavy—based on steam distillation experiments.[7,8]

Tables 2 and 3 show the characteristics of the three pseudocomponents and the relationship between viscosity and temperature, while Table 4 shows the characteristics with different mole fractions of the three pseudocomponents.

RESERVOIR PRESSURE EFFECT

Fig. 3



PSEUDOCOMPONENT VISCOSITY

Table 3

Temperature, °C.	Light component	Middle component	Heavy component
	cp		
20	2.328	10.583	5,780
60	1.9935	9.061	1,380
100	1.4905	6.775	187
140	1.1403	5.183	47
180	0.8896	4.0434	17.4
220	0.7058	3.2082	8.5
260	0.5683	2.5833	5.2

Simulation results

Our study involved determining the sweep efficiencies of conventional waterflooding and steamflooding with or without considering the distillation effect for oil with several different viscosities, assuming a 95% water cut as the end point.

Operating parameters for the steamflood included a 0.5 steam quality, 1.2 production factor, and a 1.8 tonnes/day-hectare-m steam injection rate. Table 5 shows the displacement efficiencies.

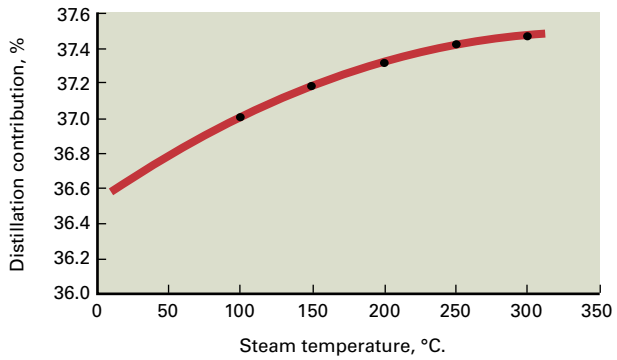
As seen from Table 5, the conventional heavy oil (crude oil viscosity greater than 50 cp) distillation effect can improve displacement efficiency, but it is not the main mechanism. Therefore, steamflooding in heavy oil reservoirs generally ignores the effect of steam distillation, especially if the crude viscosity is greater than 1,000 cp.

For a thin oil reservoir with crude viscosity less than 50 cp, one cannot ignore the effect of steam distillation during steamflooding.

Chu showed that the distillation effect is the most important mechanism for enhancing oil recovery in steamflooding of thin oil reservoirs.[9] For instance, a crude oil with a 60% distillable components has a 37% ratio of distillation effect contribution to oil recovery, a 20% increase in relative permeability with the temperature increase, and a 12% increase because of an improved sweep efficient caused by the viscosity

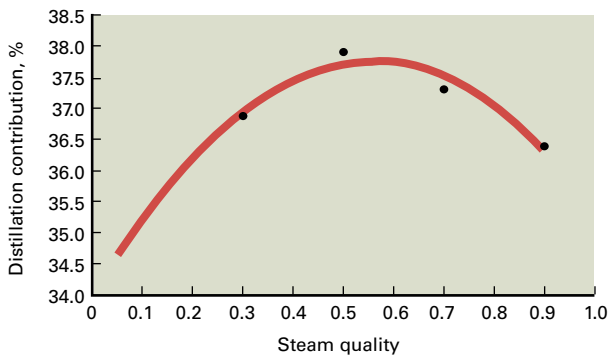
Steam temperature effect

Fig. 4



Steam quality effect

Fig. 5



reduction with heating.

For some lighter crude oil, the contribution of the distillation effect can reach 60%.

The laboratory simulation results showed that the relationships of steam distillation effect with the type of porous medium, steam injection rate, initial oil saturation (or the residual oil saturation after waterflood) was not obvious.

The most important internal factor is the crude oil properties, and the key external factors are the steam temperature and formation pressures.

We used a numerical stimulation to study the effects of crude oil viscosity, relative density, temperatures, pressure, and initial oil in place on distillation.

The effect of steam distillation mostly depends on the crude properties. In the normal case, a smaller relative crude density results in more distilled components. A smaller crude viscosity leads to a greater steam distillation ratio.

Figs. 1 and 2 show the effects of dead oil viscosity and density on distillation.

Table 6 shows the results of steamflooding in thin reservoirs at four water-cut stages. As seen from Table 6, an increased water saturation leads to a poorer steamflood, but the effect of the water storage volume on the distillation effect is not significant because when the water saturation increases, the corresponding oil saturation decreases.

The solvent banks formed in the steam drive process are small and the stability of the steam front becomes poor, which results in stream breaking through easily and leads to a poor steamflood.

Figs. 3 and 4 show the effect of reservoir pressure and temperature on distillation. The results indicate that steam distillation has a strong relationships with temperature and pressure, especially pressure. With a pressure increase, steam specific volume decrease sharply, so that one should decrease reservoir pressure as low as possible if the conditions allow.

Steam pressure increases with increment temperature increases. This allows for the heavy components, which cannot vaporize under low steam pressure, to vaporize as distillates.

Compared with reservoir pressure, the effect of saturation vapor temperature on distillation is not obvious. With the increment increase of steam temperature, saturation pressure correspondingly increases greatly, making the steam heat function have a much smaller increase.

Distillation plays a leading role during steamflooding in thin oil reservoirs, but pressure and waterflooding hinder the distillation effect. Therefore, for highly waterflooded reservoirs, one should first depressurize them before commencing a steamflood.

Fig. 5 shows the steam distillation effect for different steam qualities. During

Pseudocomponent mole fraction

Table 4

Light component	Middle component	Heavy component	Density, g/cc	Molecular weight	Viscosity, cp
Mole fraction, %					
50	35	15	0.874	367	11.62
30	40	30	0.902	430	38.39
15	50	35	0.918	467	64.89
15	35	50	0.929	491	158.5
10	10	80	0.956	549	1,019

Displacement efficiency

Table 5

Viscosity, cp	Waterflooding	Steamflooding without distillation	Steamflooding with distillation	Distillation effect
	%			
11.62	28.27	58.01	77.34	39.38
38.39	24.71	58.10	73.76	31.94
64.89	22.94	57.77	63.20	13.48
158.5	19.22	57.62	63.23	12.75
1,019	6.64	56.34	56.83	0.97

Water saturation

Table 6

Water saturation	Displacement with distillation	Distillation effect contribution
%		
25	75.08	30.20
30	74.22	30.00
35	73.51	29.60
40	72.47	29.45

INJECTION RATE Table 7

Injection rate, tonnes/ day-ha-m	Displacement with distillation, %	Distillation effect contribution, %
1.2	65.2	30.79
1.6	69.6	32.58
1.8	71.1	33.04
2.5	72.4	33.35

the thermal recovery process, the steam does not need to enter all the rock pores. Maintaining the temperature of the heat carrier can increase the heat effect.

Increasing steam quality is the main method for maintaining the temperature of the heat carrier. Regarding the thermophysical parameters of steam, steam has high latent heat of vaporization and specific volume, and the heat of high quality wet steam is greater than that of low quality wet steam. Furthermore, the energy of a vapor water molecule is greater than that of the liquid state and results in a stronger steam distillation effect.

Table 7 shows the effect of steam injection rate on steam distillation. Steam injection rate and steam injection pressure are two related parameters. Increased steam injection rate needs an increased steam injection pressure.

Increasing steam injection rate helps in reducing wellbore heat loss and improves steam quality at the bottom of the hole and thus increases steam distillation. High pressure, however, will suppress steam distillation, so that injection rate has a limited effect on steam distillation. ✦

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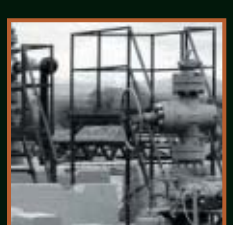

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New correlation predicts flue gas sulfuric acid dewpoints

Bahman ZareNezhad
Ministry of Science, Research and Technology
Tehran

A new correlation accurately predicts the flue-gas sulfuric-acid dewpoints to mitigate corrosion problems in process equipments and heat-recovery systems.

Acidic combustion gases can cause rapid corrosion when they condense on pollution control or energy-recovery equipment. This accurate and reliable correlation predicts sulfuric-acid dewpoints over wide ranges of sulfur trioxide and water vapor concentrations.

The correlation outperforms other available correlations both in accuracy and generality. The predicted flue-gas sulfuric-acid dewpoints are in excellent agreement with experimental data with the root mean square deviation of 0.73.

Flue-gas SOx

Sulfur compounds such as H_2S, methyl mercaptan (CH_4S), and sulfur (S_x) are present in industries chiefly as undesirable by-products of fossil fuel processing, including natural gas and petroleum. These pollutants burn in the incinerator to produce sulfur oxides in the flue combustion gas.[1,2]

Flue gas always contains substantial water vapor. Sulfur trioxide and water have a great affinity for each other: When temperatures are lowered to the dewpoint, the two combine rapidly to form sulfuric acid. The condensed sulfuric acid also has a powerful affinity for water to the extent that the concentrations of sulfuric acid occurring at elevated dewpoint temperatures are corrosive to steel and almost all plastics, as well as hydraulic cement composites.[3]

Further, if the gas is cooled below this dewpoint by radiation or convection, a mist of corrosive acid droplets forms that is highly detrimental to the stack and heat-recovery exchangers.[3,4] Fig. 1 shows the trend of corrosion rate vs. wall temperature as the flue-gas temperature falls below the sulfuric-acid dewpoint

Verhoff and Banchero provided the correlation (Equation 1 in the accompanying box) for predicting flue-gas sulfuric-acid dewpoint.[5] It should be noted that there are

Equations

Verhoff and Banchero correlation:

$$\frac{1}{T_{Dew}+273.15} = 0.002276 - 0.00002943\ln p_{H2O} - 0.0000858\ln p_{SO3} + 0.000006260(\ln p_{SO3})(\ln p_{H2O}) \quad (1)$$

Okkes correlation:

$$T_{Dew} = 203.25 + 27.6\log p_{H2O} + 10.83\log p_{SO3} + 1.06(\log p_{SO3}+8)^{2.19} \quad (2)$$

New proposed correlation:

$$T_{Dew} = 150 + 11.664\ln(p_{SO3}) + 8.1328\ln(p_{H2O}) - 0.383226\ln(p_{SO3})\ln(p_{H2O}) \quad (3)$$

Modified Verhoff and Banchero correlation:

$$\frac{1}{T_{Dew}+273.15} = 0.002281 - 0.00003103\ln p_{H2O} - 0.00008611\ln p_{SO3} + 0.000006193(\ln p_{SO3})(\ln p_{H2O}) \quad (4)$$

Modified Okkes correlation:

$$T_{Dew} = 202.96 + 28.32\log p_{H2O} + 10.81\log p_{SO3} + 1.14(\log p_{SO3}+8.06)^{2.185} \quad (5)$$

$$RMSD = \sqrt{\frac{\sum_{i=1}^{N}[(T_{Dew,calc.})_i - (T_{Dew,exp.})_i]^2}{N}} \quad (6)$$

Nomenclature

T_{Dew}	=	Sulfuric-acid dewpoint temperature, °C.
p_{H2O}	=	Partial pressure of H_2O in the flue gas, mm Hg
p_{SO3}	=	Partial pressure of SO_3 in the flue gas, mm Hg
y_{H2O}	=	Concentration of H_2O in the flue gas, vol %
y_{SO3}	=	Concentration of SO_3 in the flue gas, ppm (vol)
RMSD	=	Root mean square deviation
i	=	Data point index
N	=	Number of data points

some disagreements between experimental data and the Verhoff and Banchero correlation, especially at low SO_3 concentration and high H_2O content.

Dewpoints predicted in the range of 120-140° C. have a positive deviation of 4° C. and more. Also in the range of 100-121° C., the predicted dewpoints are 2.5-4° C. low.

Okkes proposed a correlation to overcome some of these shortcomings that can be written as Equation 2, in which the partial pressures are expressed in atmosphere and the dewpoint is in °C.[6] Although this correlation is more accurate at H_2O concentrations higher than 25%, but it significantly under predicts the acid dewpoints at low H_2O concentrations prevailing in the oil and gas industry.

New correlation

This work proposes a new correlation (Equation 3), based on all verified experimental data, for accurate prediction of flue-gas sulfuric-acid dewpoints. A set of 188 validated data points[7] has been used to derive the correlation.

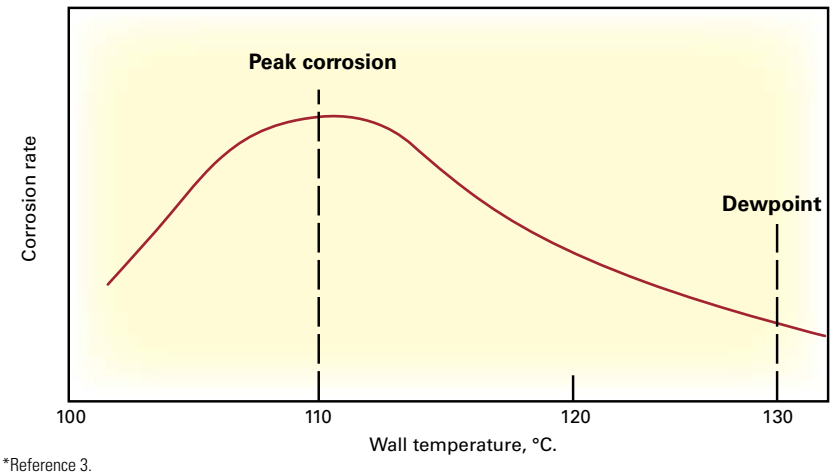
Fig. 2 uses Equation 3 to predict flue-gas sulfuric-acid dewpoints and compares them with experimental data at different SO_3 and H_2O concentrations in Fig 2. As shown, the acid dewpoint is very sensitive to the flue-gas SO_3 concentration so that a small increase in SO_3 concentration leads to a large increase in acid dewpoint at a given H_2O concentration.

The effect of moisture concentration on acid dewpoint is moderate, however, especially at high SO_3 concentrations. As shown, the SO_3 species has a very strong influence on sulfuric-acid dewpoint at SO_3 concentrations of less than 100 ppm (vol). Thus accurate prediction of acid dewpoints, especially at low SO_3 concentrations prevailing in petroleum industries, is very important to mitigate corrosion problems in process equipments.[8]

Flue gas always contains a substantial amount of water vapor. Also, the added moisture during turbine inlet-fogging operations affects the sulfuric-acid dew-

ELEVATED WALL TEMP. REDUCES CORROSION RATE*

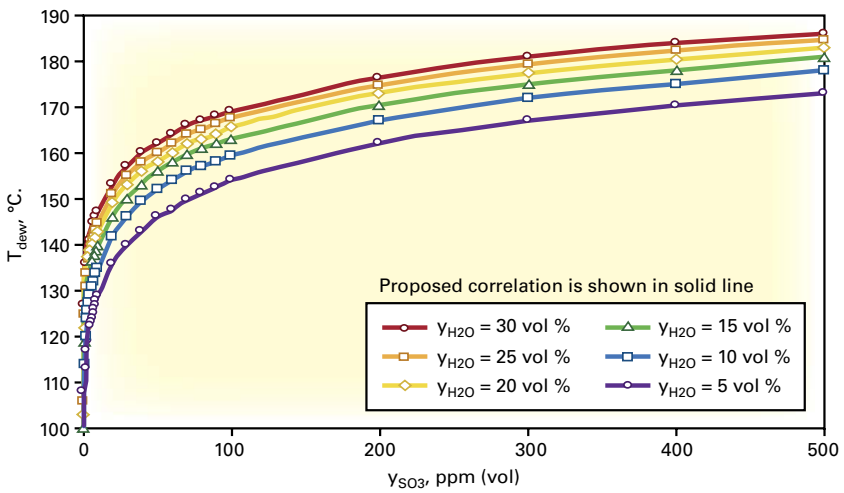
Fig. 1



*Reference 3.

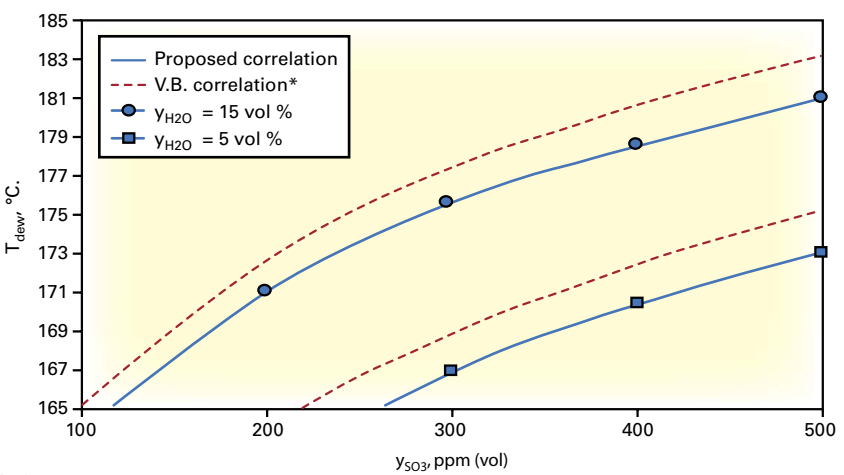
PROPOSED CORRELATION VS. EXPERIMENTAL DEWPOINTS

Fig. 2



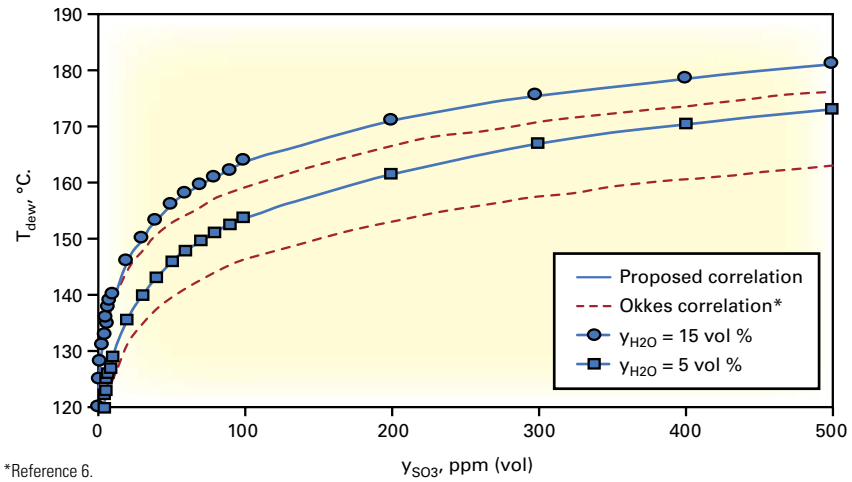
PROPOSED CORRELATION VS. V.B. CORRELATION, EXP. DATA

Fig. 3



*Reference 5.

PROPOSED CORRELATION VS. OKKES CORRELATION, EXP. DATA Fig. 4



*Reference 6.

point temperature and may thus affect allowable metal operating temperature. At a low SO_3 concentration of 1 ppm (vol), an increase of H_2O concentration from 5 to 30 vol % leads to a 19.8% increase in acid dewpoint to 127° C. from 106° C., while at a high SO_3 content of 500 ppm (vol), the same H_2O increment results in a 7.5% increase in sulfuric-acid dewpoint to 186° C. from 173° C.

At moisture concentrations higher than 30 vol %, the H_2O content does not have a major influence on the sulfuric-acid dewpoint, as shown in Fig 2. The acid dewpoints predicted by presented correlation are in good agreement with experimental data, as shown in this figure.

The acid dewpoints predicted by the presented correlation are compared with the predictions of Verhoff and Banchero and of Okkes correlations in Figs. 3 and 4, respectively. As shown there, the V.B. correlation overpredicts the experimental data, while the Okkes correlation under predicts the sulfuric-acid dewpoints significantly.

Using Verhoff and Banchero's correlation leads to a considerable acid dewpoint overprediction especially at moisture contents higher than 15 vol %. In such cases the designer may incorrectly increase the air preheating level to combat the cold-end corrosion problem so that excess energy is wasted.

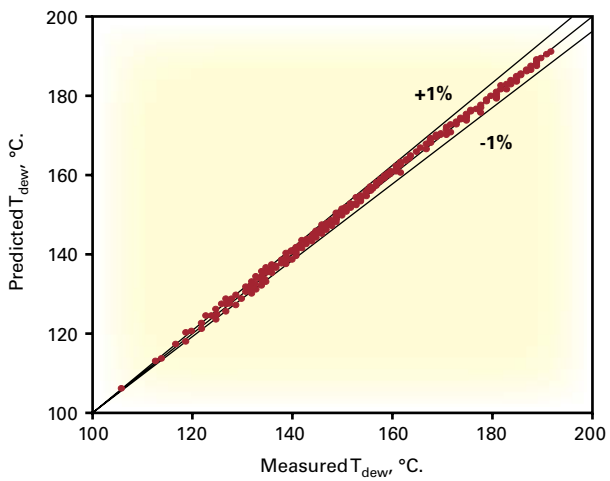
The dewpoints predicted by Equation 3 are in excellent agreement with measured sulfuric-acid dewpoints at all ranges of SO_3 and H_2O concentrations, as shown in Figs. 3 and 4. The accurate prediction of flue-gas sulfuric-acid dewpoint is important for optimization of energy consumption in combustion devices.

For better comparison of the proposed equation with previous ones, the set of new data has been used for refitting the V.B. and Okkes correlations and the modified versions of two previously correlations are obtained as shown in Equations 4 and 5. The root mean square deviation, as defined by Equation 6, is calculated for Equation 3, V.B. (Equation 1), Okkes (Equation 2), modified V.B. (Equation 4), and modified Okkes (Equation 5) correlations (see table).

Due to the difficulty in functional form of V.B. and Okkes correlations, there are no significant improvements in dewpoint predictions even by using the modified versions of these two correlations, as shown in the table. According to this table, the root mean square deviation of the proposed correlation with respect to the experimental data is about 0.73, much smaller than those of the other correlations.

The predicted sulfuric-acid dewpoints according to Equation 3 are also compared with all available experimental data in Fig 5 at a relative deviation of 1%. As shown there, the proposed correlation can be used for accurate prediction of the flue-gas sulfuric-acid dewpoint temperature and evaluating the corrosion risk in process equipments and heat recovery systems.

PROPOSED CORRELATION VS. MEASURED FLUE-GAS TEMPS. Fig. 5



RMSD ERROR OF DIFFERENT CORRELATIONS*

Correlations	Root mean square deviation
Proposed (Equation 3)	0.73
Verhoff and Banchero (Equation 1)	1.84
Okkes (Equation 2)	2.43
Modified Verhoff and Banchero (Equation 4)	1.79
Modified Okkes (Equation 5)	2.31

*Flue-gas sulfuric-acid dewpoint prediction.

Acknowledgment

The author thanks the National Ira-

nian Gas Co. for its cooperation during the preparation of the manuscript. ✦

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China's strategic reserves capacity to double by 2011

Kang Wu
East-West Center
Singapore

Liutong Zhang
FACTS Global Energy
Singapore

China's strategic petroleum reserves capacity will have doubled by 2011-12. This rapid expansion of Chinese petroleum storage capability, coupled with robust growth in oil demand, will only see China's demand for imports—particularly of crude oil—grow. Such growth will create potential difficulties for China, Asia, and the world at large.

This article provides an overview of recent developments in China's strategic petroleum reserves and commercial storage.

SPR

China's SPRs are being constructed in three phases.

Phase I entered service at the end of 2008, with crude storage capacity of 103 million bbl. Phase II will have 168.6 million bbl capacity and be completed by 2011-12. China's strategic storage will likely rise to about 500 million bbl following completion of Phase III.

China's National Energy Administration, under the National Development and Reform Commission, is in charge of the country's SPRs, and home to the National Office of SPRs. The NEA administrator, Zhang Guobao, also serves as one of the nine NDRC vice-chairmen.

The NDRC is in charge of policy and planning for SPRs. The NEA organizes reserve base construction, procures oil, and executes use and turnover decisions. CNPC-PetroChina, Sinopec, and Sinochem are responsible for facilities maintenance and site management.

Phase I

The sites for China's SPR Phase I are Zhenhai, Zhoushan, Huangdao, and Dalian. Construction began in 2004 and was completed at the end of 2008. The tanks have been fully filled and can support 13-14 days of oil consumption or 25-26 days of net oil imports based on 2008 levels. Table 1 details the four sites.

Zhenhai and Zhoushan's Phase I tanks, with total capacity of about 40 million bbl, were filled before oil prices rose above $70/bbl in July 2007. China did not pump oil into the other tanks from August 2007 to September 2008 when crude oil prices were higher than $70/bbl. It put about 60 million bbl of imported crude into storage from October 2008 to the end of March 2009, averaging more than 300,000 b/d. The crude price purchased for SPR Phase I averaged $58/bbl.

Phase II

NDRC plans eight strategic stockpiling bases under Phase II, with a total capacity of 169 million bbl. Differing from Phase I, which includes all aboveground tanks in coastal areas, China plans to build some of its Phase II SPRs in underground water-sealed caverns in inland provinces.

NDRC will divide China's SPRs under

CHINA SPR PHASE I SITES

Table 1

	Capacity, million bbl	Capacity, million cu m	Completion date	Investment, million yuan
Zhenhai (Sinopec)	32.7	5.2	August 2006	3,700
Zhoushan (Sinochem)	31.4	5.0	—	3,800
1st Phase	7.5	1.2	March 2007	—
2nd Phase	9.4	1.5	November 2007	—
3rd Phase	14.5	2.3	December 2007	—
Huangdao (Sinopec)	20.1	3.2	—	2,600
1st Phase	7.5	1.2	June 2007	—
2nd Phase	12.6	2.0	December 2007	—
Dalian (PetroChina)	18.9	3.0	December 2008	2,510
Total	**103.1**	**16.4**		**12,610**

Phase II into three categories:

- National SPR.
- Commercial petroleum storage by state oil companies.
- Commercial storage by local governments or companies.

Table 2 details eight Phase II sites. One is complete and three are under construction, with the other sites being prepared for construction. At least 19 million bbl of Phase II storage have come on stream since yearend 2008. By yearend 2009 or early 2010 about 69 million bbl will be ready, with full capacity reached by yearend 2011 or early 2012.

- Commercial crude storage at Baishawan, Pinghu in Zhejiang (Sinopec). Sinopec finished building a 2 million cu m commercial crude reserve base at Baishawan in Jiaxing City, Zhejiang Province in January 2009.

It includes two 50,000-cu-m tanks, thirteen 100,000-cu-m tanks, and four 150,000-cu-m tanks, and all supporting equipment. Pinghu (Baishawan) is an important transit point for Sinopec's 400, 000-b/d Ningbo-Shanghai-Nanjing crude pipeline network. The pipeline supplies feedstock to Sinopec's refineries in the Yangtze River delta.

- National commercial crude storage in Shanshan, Xinjiang (PetroChina). Managed by PetroChina, this facility has a designed capacity 50 million bbl. Total planned investment equals 6.5 billion yuan (about $952 million).

Crudes come from Xinjiang oil fields via the Shanshan Lanzhou crude pipeline, as well as from Kazakhstan. PetroChina started construction in March 2008 and completed its first phase at year end 2008. The first phase of Shanshan oil storage holds 6.3 million bbl and cost 856 million yuan. Storage fill is under way. The 7-million-cu-m second phase is scheduled to be complete yearend 2009.

- National commercial crude storage at Tieling, Liaoning (PetroChina). This 7.3-million-bbl facility started construction in 2007 and should come online by yearend 2009.
- Commercial crude storage in Jinzhou, Liaoning (PetroChina). The first phase of the project includes construction of six 100,000-cu-m crude storage tanks at a total investment of 680 million yuan ($100 million). Construction began May 2008 and is to be completed in 2010. Upon completion, in addition to use as commercial storage, the site will transfer crudes through the port of Jinzhou at 40,000 b/d.
- National commercial crude storage at Caofeidian, Hebei (Sinopec). Land leveling for this 33-million-bbl facility is under way. The site is near Jidong oil field. Sinopec built a 300,000-tonne crude oil dock in Caofeidian with 400,000-b/d capacity. Sinopec's 190-km Caofeidian-Tianjin crude oil pipeline, with 400,000-b/d capacity, began operations July 2008.
- Commercial crude storage in Tianjin (Sinopec). China has started preliminary work on two 20.1-million-bbl tank farms at an oil storage base in Tianjin, one as an SPR and the other for commercial use.
- Gansu-Lanzhou site (PetroChina). The State Council earmarked Gansu as a strategic oil reserve depot as part of its 11th 5-Year Plan (2006-2010) for Western Development. PetroChina will manage the 12.6-million-bbl facility. Estimated cost of the facility is 1.83 billon yuan ($261 million). The environmental appraisal for the project is complete and the land permit is currently being sought. PetroChina plans to complete the construction of the site within 3 years.

The reserve will take in crude from the China-Kazakhstan pipeline and Xinjiang oil fields. Crude from the storage facility will then flow southwest via the new Lanzhou-Chengdu pipeline (operational in 2010) to CNPC's recently approved Sichuan refinery.

- Commercial underground crude storage in Zhanjiang (Sinopec). Zhanjiang's local government says a 44-million-bbl underground storage cavern with an estimated investment of 2.3 billion yuan (US$337 million) is under preliminary study.

China SPR likely Phase 2 sites

Table 2

Company	Site	Capacity, million bbl	Capacity, million cu m	Status	Completion date
Sinopec	Pinghu, Baishawan, Zhejiang	12.6	2.0	Completed	Early 2009
PetroChina	Shanshan, Xinjiang	50.3	8.0	Building	—
	1st Phase	6.3	1.0	Completed	Dec. 24, 2008
	2nd Phase	44.0	7.0	Building	End-2009
PetroChina	Tieling, Liaoning	7.3	1.2	Building	End-2009
PetroChina	Jinzhou	3.8	0.6	Building	2010
Sinopec	Caofeidian	32.7	5.2	Land leveling	2011-12
Sinopec	Tianjin	40.2	6.4	Preliminary work	2011-12
PetroChina	Lanzhou	12.6	2.0	Completed environmental appraisal	2011-12
Sinopec	Zhanjiang, Guangdong	44.0	7.0	Planning	—

Commercial storage

China had at least 300 million bbl of crude storage capacity at the start of 2009, of which Sinopec owns nearly half, CNPC-PetroChina around 40%, and CNOOC-SinoChem-others the rest. Actual and effective sizes, however, vary and because these storage tanks—old and new—are all over the country, their overall utilization rates, particularly at old facilities, are low.

Sinopec established its Sinopec Commercial Crude Reserve Center in 2008 to manage its oil storage. The center will manage financing of oil procurement and flows into and out of storage.

At least 30 million bbl of commercial crude storage has come on line since end-2008 and more is expected in the near future. Table 3 provides details of recently completed large commercial storage bases and bases expected to come on stream in the next few years.

• Commercial crude storage in Lanshan, Zhenhai Ningbo (Sinopec). The Lanshan reserve base, in Ningbo's Zhenhai district, has 38 tanks with a combined capacity of 23.9 million bbl. It is next to China's 5.2-million-cu-m Zhenhai SPR base. Sinopec started filling the commercial oil reserve base in January 2009.

Similar to Sinopec's Pinghu commercial crude reserve base, Lanshan is an important transit point for the Ningbo-Shanghai-Nanjing crude pipeline network, which supplies feedstock to Sinopec's refineries in the Yangtze River delta.

• Commercial crude storage in Zhoushan (Sinochem). Sinochem is building a 2-million-cu-m crude and refined-product storage in Zhoushan. It finished Phase I of the project, totaling more than 1 million cu m, in second-quarter 2009 and plans to complete Phase II by yearend 2010. The site is next to the Zhoushan SPR base.

• Commercial crude storage in Dushanzi, Xinjiang autonomous region (PetroChina). Construciton of this 13-million-bbl facility will be complete by yearend 2009.

• Commercial crude storage in Linyuan, Daqing (PetroChina). PetroChina is building a 1.2-million-cu-m crude storage facility in Linyuan, Daqing, to be completed by 2010. Investment in the project totals an estimated 1.2 billion yuan. By late May 2009, two tanks were completed.

Before this project PetroChina had nine crude tanks with a total capacity of 300,000 cu m at Linyuan, receiving oil from the Daqing field via pipeline and from Russia by train.

The newly expanded facility will also receive Russian oil by pipeline through an offshoot of the East Siberia-Pacific Ocean pipeline, currently under construction. The link to China is expected to be built in third-quarter 2010. Oil from Linyuan storage will then move via pipeline to Tieling in the neighboring Liaoning province. From there it can enter PetroChina's northeast crude pipeline network for delivery to the company's refineries in northeast China.

• Commercial crude storage in Yanpu Island, Hainan (Sinopec). The NDRC approved Sinopec's plan to build 15 million cu m of commercial oil reserves on Yanpu Island, where it has a 160,000-b/d refinery. China might also include Yanpu on the list for SPR Phase III sites. Yanpu has a deepwater port and is near the Malacca Straits and Nanhai oil and gas fields.

• Commercial crude oil storage in Dalian (PetroChina). PetroChina is building a 10-million-cu-m commercial crude oil storage facility near Dalian port. PetroChina has completed the first two phases of the project, and Phase III is scheduled to come on stream in first-half 2010.

• Commercial crude oil storage in Yanpu, Hainan (Vopak, SDIC). Royal Vopak signed a joint-investment agreement in January 2009 with China's State Development and Investment Corporation (SDIC) to build a large commercial crude oil tank farm in Yangpu, Hainan Island. The project will store up to 32 million bbl of crude and products and will come on stream as early as 2011. Investment in the project totals an estimated $1 billion or more.

The facility will include a 300,000-tonne crude terminal and smaller berths for refined products tankers. The two companies are currently evaluating the project.

Vopak also runs chemical and oil storage facilities in Jiangsu, Fujian, Zhejiang, Shandong, and Tianjin.

CHINA COMMERCIAL CRUDE STORAGE SITES

Table 3

Company	Site	Capacity, million bbl	Capacity, million cu m	Status	Completion date
Sinopec	Zhenhai, Lanshan	23.9	3.8	Completed	December 2008
Sinochem	Zhoushan	12.6	2.0	—	—
	1st Phase	6.3	1.0	Completed	Second-quarter 2009
	2nd Phase	6.3	1.0	Building	End-2010
PetroChina	Dushanzi	12.6	2.0	Building	End-2009
PetroChina	Linyuan, Daqing	7.5	1.2	Building	2010
Sinopec	Yanpu	94.3	15.0	Planned	—
PetroChina	Dalian	62.9	10.0	Building	First-half 2010
Vopak, SDIC	Yanpu Island, Hainan	32.0	5.1	Feasibility study	2011

Product storage

In mid-May 2009, the Chinese government announced plans to build strategic reserves for refined products, its first official plan to expand beyond crude oil reserves. The state will build storage to hold up to 10 million tonnes of refined products by 2011. China's State Bureau of Material Reserves, a subsidiary of the NDRC, will operate the country's strategic refined products stocks.

Numerous oil product storage tanks of varying sizes are scattered around China. Capacity of these tanks at the start of 2009 totaled more than 300 million bbl, similar to the crude storage. Actual inventory, however, is far lower, showing limited utilization.

CNPC-PetroChina and Sinopec

Group have about 174 million bbl of oil product storage, about 53% of the total. CNPC-PetroChina and Sinopec are following the government's call to increase commercial oil-product storage to 252 million bbl by the end of 2013, a jump of more than 40% in 5 years. Newly added oil product storage tanks will be built in most instances as part of greenfield refineries. ✦

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Equipment/Software/Literature

Exploration, production software adds improvements

Newly released DataVera Version 8 includes improvements to existing DataVera functionality and introduces a module for exploration and production master data management (MDM).

The suite of tools leverages a repeatable and scalable E&P specific rules engine to solve complex data issues. It contains five modules to quickly complete data profiling and assessment, large scale data cleansing and consolidation, and continuing data quality monitoring.

DataVera MasterSet is the latest addition to the family and can achieve enterprise-wide MDM. In collaboration with clients who have used DataVera to implement MDM, the new module combines features that existed in the other DataVera modules into a single module with improved functionality.

MasterSet has advanced MDM rules to help users consolidate individual DataVera HealthCheck quality metrics across multiple data stores, and it includes more matching algorithms and E&P specific rules.

More than 400 new E&P specific data quality rules have been added to the DataVera repository of 10,000+ rules as part of Version 8. This empowers E&P companies with an enhanced solution and the high quality data. In addition, a new "rules builder" wizard has been added so that users can quickly and effectively create complex rules.

Google Earth has been integrated into the whole suite of modules. In addition, continuous work has also been completed around the integration with other applications, such as PetrisWINDS Enterprise and OpenWorks.

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

Safety apparel for oil and gas industry

The expansion of this firm's existing line of work wear garments includes a complete offering of personal protective equipment for the oil and gas industry.

New oil and gas-specific garments include work wear, insulated work wear, inner layers, and accessories. Many of these new garments offer flame retardant and antistatic protection along with thermal comfort and high visibility options.

The firm provides a one-source solution for protective boots and PPE apparel for the industry. Three global operations centers are located in North America, Europe, and the Middle East.

Work wear is offered in four categories for 1) warm and temperate climates, 2) insulated workwear for cold and severe arctic conditions, 3) inner layers such as socks, thermal underwear, and hard hat liners, and 4) accessories such as gloves and safety glasses.

Options include coveralls, shirts, trousers, bib 'n' brace, jackets, rainwear, insulated coveralls, and parkas.

Source: **Red Wing Shoe Co.,** 314 Main St., Red Wing, MN 55066.

Services/Suppliers

MOGAS Industries Ltd.,

Houston, has named LaShunda Hubbard inside sales engineer for its FlexStream line of control valves. She previously worked for Bechtel as a controls and instrument engineer. She also worked for the National Aeronautics & Space Administration as a data process system engineer and for Applied Materials, Austin, as a manufacturing engineer. Hubbard has a BS from Prairie View A&M University.

Hubbard

MOGAS is a leading provider of severe-service, metal-seated ball valves to the oil and gas, refining, petrochemical, and other industries.

ABS,

Houston, has promoted Joseph Brincat to vice-president, Middle East and Pakistan. Meanwhile, the ABS regional administrative office will relocate from Doha to Dubai. Brincat replaces Stephen Auger, who has been transferred to Busan, South Korea, to serve as vice-president, North Pacific, within the Pacific division of ABS that includes South Korea, Japan, and the Philippines. Previously, Brincat was district manager for the Middle East region, which includes Egypt and Libya. In addition, Martin Hruska has been promoted to country manager, Qatar. A 17-year veteran with ABS, Hruska will transfer from Singapore, where he was director, offshore technology and business development, for the Pacific division.

ABS is a leading international classification society devoted to promoting the security of life, property, and the marine environment through the development and verification of standards for the design, construction, and operational maintenance of marine-related facilities.

CGGVeritas,

Paris, has announced that ARGAS, one of its joint ventures with TAQA in the Middle East, has opened a technology center in Al Khobar, Saudi Arabia. The new facility is an open center designed to serve the oil and gas community in the kingdom with a suite of state-of-the-art capabilities and resources. The center offers a focal point for both local oil and gas players and researchers from the Earth Sciences Department of King Fahd University of Petroleum and Minerals to benefit from cooperation with R&D experts to address specific geophysical challenges; high-end processing and imaging technologies, including a visualization center; and access to training from CGGVeritas University. CGGVeritas said the center's goal is to locally apply and advance the processing algorithms it develops globally in order to unmask the embedded value of the seismic data it has been acquiring in Saudi Arabia for many years.

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

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Statistics

Imports of crude and products

	Districts 1-4		District 5		Total US		
	9-4 2009	8-28 2009	9-4 2009	8-28 2009	9-4 2009	8-28 2009	*9-5 2008
	1,000 b/d						
Total motor gasoline	978	875	7	3	985	878	1,121
Mo. gas. blending comp.	799	547	—	3	799	550	849
Distillate	221	156	14	—	235	156	117
Residual	367	131	29	4	396	135	325
Jet fuel-kerosine	45	51	48	61	93	112	26
Propane-propylene	169	81	4	4	173	85	157
Other	(164)	250	42	52	(122)	302	213
Total products	**2,415**	**2,091**	**144**	**127**	**2,559**	**2,218**	**2,808**
Total crude	**8,064**	**8,545**	**1,031**	**1,031**	**9,095**	**9,576**	**8,581**
Total imports	**10,479**	**10,636**	**1,175**	**1,158**	**11,654**	**11,794**	**11,389**

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

Purvin & Gertz LNG netbacks—Sept. 11, 2009

Receiving terminal	Liquefaction plant					
	Algeria	Malaysia	Nigeria	Austr. NW Shelf	Qatar	Trinidad
	$/MMbtu					
Barcelona	5.82	3.72	4.95	3.62	4.28	4.87
Everett	2.31	0.36	1.97	0.46	0.87	2.57
Isle of Grain	2.56	0.60	1.98	0.51	1.11	2.01
Lake Charles	0.59	–0.52	0.38	–0.47	–0.53	1.15
Sodegaura	4.91	7.10	5.17	6.81	6.11	4.27
Zeebrugge	5.11	3.01	4.48	2.95	3.57	4.54

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	14,368	54,592	36,192	12,520	71,653	13,012	3,903
PADD 2	82,231	50,550	25,643	7,624	32,859	1,031	30,321
PADD 3	171,492	70,067	37,965	15,920	46,900	14,695	34,114
PADD 4	15,205	5,586	1,674	523	2,918	212	[1]1,981
PADD 5	54,186	26,358	21,174	8,754	11,226	4,633	—
Sept. 4, 2009	**337,482**	**207,153**	**122,648**	**45,341**	**165,556**	**33,583**	**70,319**
Aug. 28, 2009	**343,388**	**205,085**	**120,566**	**45,755**	**163,563**	**33,892**	**69,131**
Sept. 5, 2008[2]	**298,034**	**187,942**	**96,054**	**39,815**	**130,460**	**36,695**	**54,451**

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

Refinery report—Sept. 4, 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	1,324	1,305	2,417	78	409	103	53
PADD 2	3,280	3,262	2,124	204	873	35	258
PADD 3	7,766	7,646	2,880	759	2,205	324	727
PADD 4	579	571	318	30	186	12	[1]64
PADD 5	2,436	2,321	1,501	377	470	126	—
Sept. 4, 2009	**15,385**	**15,105**	**9,240**	**1,448**	**4,143**	**600**	**1,102**
Aug. 28, 2009	**15,377**	**14,951**	**9,157**	**1,403**	**4,120**	**581**	**1,080**
Sept. 5, 2008[2]	**13,783**	**13,483**	**8,398**	**1,410**	**3,921**	**520**	**935**
	17,644 Operable capacity		**87.2% 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.

OIL&GAS JOURNAL online research center

OGJ crack spread

	*9-11-09	*9-12-08	Change	Change, %
	$/bbl			
SPOT PRICES				
Product value	75.24	124.62	–49.37	–39.6
Brent crude	69.20	100.48	–31.28	–31.1
Crack spread	6.04	24.14	–18.10	–75.0
FUTURES MARKET PRICES				
One month				
Product value	75.29	117.83	–42.54	–36.1
Light sweet crude	70.91	102.85	–31.94	–31.1
Crack spread	4.38	14.99	–10.60	–70.8
Six month				
Product value	79.79	116.43	–36.64	–31.5
Light sweet crude	73.08	104.46	–31.38	–30.0
Crack spread	6.71	11.97	–5.26	–44.0

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

OGJ GASOLINE PRICES

	Price ex tax 9-9-09	Pump price* 9-9-09	Pump price 9-10-08
	¢/gal		
(Approx. prices for self-service unleaded gasoline)			
Atlanta	207.4	253.9	364.7
Baltimore	212.4	254.3	368.4
Boston	214.8	256.7	365.6
Buffalo	207.8	268.7	360.0
Miami	221.1	272.7	361.3
Newark	212.7	245.3	354.3
New York	201.8	262.7	364.6
Norfolk	209.3	247.7	359.6
Philadelphia	213.0	263.7	367.6
Pittsburgh	213.6	264.3	363.3
Wash., DC	225.3	263.7	362.3
PAD I avg	212.6	259.4	362.9
Chicago	213.2	277.6	394.3
Cleveland	215.8	262.2	357.8
Des Moines	212.0	252.4	351.8
Detroit	218.3	277.7	368.7
Indianapolis	204.2	263.6	357.8
Kansas City	200.7	236.7	351.8
Louisville	219.3	260.2	361.8
Memphis	200.1	239.9	350.8
Milwaukee	212.9	264.2	366.8
Minn.-St. Paul	216.4	260.4	358.8
Oklahoma City	192.8	228.2	350.1
Omaha	188.9	234.2	361.8
St. Louis	196.2	232.2	352.8
Tulsa	189.6	225.0	345.7
Wichita	193.9	237.3	347.8
PAD II avg	205.0	250.1	358.6
Albuquerque	201.7	238.1	358.9
Birmingham	204.8	244.1	359.0
Dallas-Fort Worth	206.1	244.5	346.2
Houston	202.7	241.1	343.2
Little Rock	197.3	237.5	358.0
New Orleans	205.7	244.1	361.0
San Antonio	207.3	245.7	357.0
PAD III avg	203.6	242.1	354.8
Cheyenne	223.9	256.3	356.5
Denver	224.9	265.3	388.4
Salt Lake City	215.9	258.8	380.5
PAD IV avg	221.6	260.1	375.2
Los Angeles	238.3	305.4	391.5
Phoenix	228.4	265.8	366.1
Portland	244.0	287.4	369.2
San Diego	240.3	307.4	393.5
San Francisco	247.3	314.4	401.1
Seattle	246.2	302.1	378.1
PAD V avg	240.8	297.1	383.3
Week's avg.	**213.1**	**258.7**	**363.8**
Aug. avg.	**209.9**	**255.5**	**375.3**
July avg.	**205.6**	**251.2**	**405.7**
2009 to date	**175.2**	**220.8**	—
2008 to date	**309.7**	**353.6**	—

*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

	9-4-09 ¢/gal		9-4-09 ¢/gal
Spot market product prices			
Motor gasoline (Conventional-regular)		Heating oil No. 2	
New York Harbor	180.00	New York Harbor	168.10
Gulf Coast	174.50	Gulf Coast	166.35
Los Angeles	214.50	Gas oil	
Amsterdam-Rotterdam-Antwerp (ARA)	185.97	ARA	169.94
Singapore	185.88	Singapore	181.19
Motor gasoline (Reformulated-regular)		Residual fuel oil	
New York Harbor	196.50	New York Harbor	147.21
Gulf Coast	173.25	Gulf Coast	155.79
Los Angeles	226.50	Los Angeles	177.15
		ARA	152.65
		Singapore	160.52

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

BAKER HUGHES RIG COUNT

	9-11-09	9-12-08
Alabama	3	6
Alaska	7	11
Arkansas	43	58
California	20	47
Land	19	46
Offshore	1	1
Colorado	43	116
Florida	2	3
Illinois	2	0
Indiana	2	2
Kansas	23	11
Kentucky	9	12
Louisiana	144	190
N. Land	95	85
S. Inland waters	5	21
S. Land	17	28
Offshore	27	56
Maryland	0	0
Michigan	0	2
Mississippi	12	17
Montana	3	12
Nebraska	0	0
New Mexico	49	90
New York	2	7
North Dakota	47	74
Ohio	8	10
Oklahoma	74	216
Pennsylvania	54	28
South Dakota	0	1
Texas	373	949
Offshore	4	11
Inland waters	0	1
Dist. 1	18	28
Dist. 2	12	34
Dist. 3	36	61
Dist. 4	32	92
Dist. 5	69	184
Dist. 6	42	130
Dist. 7B	8	34
Dist. 7C	22	72
Dist. 8	69	133
Dist. 8A	10	26
Dist. 9	24	43
Dist. 10	27	100
Utah	15	47
West Virginia	20	28
Wyoming	35	81
Others—HI-1; NV-2; TN-1; VA-5	9	13
Total US	**999**	**2,031**
Total Canada	**206**	**433**
Grand total	**1,205**	**2,464**
US Oil rigs	288	413
US Gas rigs	699	1,606
Total US offshore	34	74
Total US cum. avg. YTD	**1,086**	**1,864**

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	9-11-09 Percent footage*	Rig count	9-12-08 Percent footage*
0-2,500	50	6.0	81	3.7
2,501-5,000	75	73.3	132	51.5
5,001-7,500	114	19.2	261	16.8
7,501-10,000	210	5.7	466	2.3
10,001-12,500	204	11.7	452	1.7
12,501-15,000	142	—	359	—
15,001-17,500	129	—	135	—
17,501-20,000	55	—	80	—
20,001-over	34	—	14	—
Total	**1,013**	**11.4**	**1,980**	**6.7**
INLAND	9		15	
LAND	970		1,959	
OFFSHORE	34		6	

*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]9-11-09	[2]9-12-08
	1,000 b/d	
(Crude oil and lease condensate)		
Alabama	20	20
Alaska	655	613
California	650	657
Colorado	64	65
Florida	6	5
Illinois	28	27
Kansas	109	114
Louisiana	1,402	766
Michigan	17	18
Mississippi	62	60
Montana	87	85
New Mexico	161	160
North Dakota	190	185
Oklahoma	181	156
Texas	1,369	1,204
Utah	60	62
Wyoming	147	146
All others	66	73
Total	**5,274**	**4,416**

[1]OGJ estimate. [2]Revised.
Source: Oil & Gas Journal.
Data available in OGJ Online Research Center.

US CRUDE PRICES

	9-11-09 $/bbl*
Alaska-North Slope 27°	65.67
South Louisiana Sweet	71.00
California-Kern River 13°	60.70
Lost Hills 30°	69.20
Wyoming Sweet	59.79
East Texas Sweet	65.25
West Texas Sour 34°	60.75
West Texas Intermediate	65.75
Oklahoma Sweet	65.75
Texas Upper Gulf Coast	58.75
Michigan Sour	57.75
Kansas Common	64.75
North Dakota Sweet	55.50

*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]	9-4-09
United Kingdom-Brent 38°	68.94
Russia-Urals 32°	68.59
Saudi Light 34°	67.34
Dubai Fateh 32°	69.18
Algeria Saharan 44°	69.32
Nigeria-Bonny Light 37°	70.70
Indonesia-Minas 34°	73.13
Venezuela-Tia Juana Light 31°	68.08
Mexico-Isthmus 33°	67.97
OPEC basket	68.92
Total OPEC[2]	68.41
Total non-OPEC[2]	67.62
Total world[2]	68.07
US imports[3]	65.78

[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]

	9-4-09	8-28-09	9-5-08	Change, %
	bcf			
Producing region	1,099	1,086	795	**38.2**
Consuming region east	1,831	1,776	1,716	**6.7**
Consuming region west	462	461	386	**19.7**
Total US	**3,392**	**3,323**	**2,897**	**17.1**
	June 09	**June 08**	**Change, %**	
Total US[2]	**2,752**	**2,171**	**26.8**	

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

Statistics

International rig count

Region	Aug. 2009 Land	Aug. 2009 Off.	Aug. 2009 Total	Aug. 08 Total
WESTERN HEMISPHERE				
Argentina	42	—	42	82
Bolivia	3	—	3	4
Brazil	29	34	63	55
Canada	177	2	178	449
Chile	3	—	3	1
Colombia	26	—	26	41
Ecuador	9	—	9	12
Mexico	104	30	134	104
Peru	7	1	8	8
Trinidad	—	2	2	4
United States	949	31	980	1,987
Venezuela	44	9	53	70
Other	1	—	1	1
Subtotal	**1,393**	**109**	**1,502**	**2,818**
ASIA-PACIFIC				
Australia	6	10	16	29
Brunei	—	3	3	4
China-offshore	—	22	22	24
India	58	26	84	80
Indonesia	49	11	60	63
Japan	3	—	3	3
Malaysia	—	11	11	11
Myanmar	3	1	4	5
New Zealand	3	1	4	6
Papua New Guinea	2	—	2	4
Philippines	5	1	6	2
Taiwan	—	—	—	—
Thailand	5	9	14	13
Vietnam	—	4	4	9
Other	—	—	—	4
Subtotal	**134**	**99**	**233**	**257**
AFRICA				
Algeria	25	—	25	23
Angola	—	3	3	5
Congo	1	1	2	3
Gabon	1	—	1	1
Kenya	—	—	—	—
Libya	12	1	13	15
Nigeria	1	5	6	4
South Africa	—	1	1	—
Tunisia	2	2	4	5
Other	2	1	3	6
Subtotal	**44**	**14**	**58**	**62**
MIDDLE EAST				
Abu Dhabi	8	4	12	11
Dubai	—	1	1	2
Egypt	30	10	40	60
Iran	—	—	—	—
Iraq	—	—	—	—
Jordan	—	—	—	2
Kuwait	11	—	11	13
Oman	42	—	42	55
Pakistan	20	—	20	25
Qatar	2	6	8	10
Saudi Arabia	57	10	67	75
Sudan	—	—	—	—
Syria	24	—	24	20
Yemen	7	—	7	15
Other	2	—	2	1
Subtotal	**203**	**31**	**234**	**289**
EUROPE				
Croatia	—	—	—	—
Denmark	—	2	2	2
France	—	—	—	1
Germany	7	—	7	10
Hungary	3	1	4	5
Italy	2	—	2	4
Netherlands	2	3	5	3
Norway	—	19	19	17
Poland	3	—	3	1
Romania	5	—	5	18
Turkey	6	—	6	6
UK	—	16	16	24
Other	9	—	9	—
Subtotal	**37**	**41**	**78**	**97**
Total	**1,811**	**294**	**2,105**	**3,523**

Definitions, see OGJ Sept. 18, 2006, p. 42.
Source: Baker Hughes Inc.
Data available in OGJ Online Research Center.

Oil import freight costs*

Source	Discharge	Cargo	Cargo size, 1,000 bbl	Freight (Spot rate) worldscale	$/bbl
Caribbean	New York	Dist.	200	—	—
Caribbean	Houston	Resid.	380	65	0.84
Caribbean	Houston	Resid.	500	63	0.81
N. Europe	New York	Dist.	200	142	2.63
N. Europe	Houston	Crude	400	68	1.83
W. Africa	Houston	Crude	910	51	1.56
Persian Gulf	Houston	Crude	1,900	28	1.60
W. Africa	N. Europe	Crude	910	47	1.06
Persian Gulf	N. Europe	Crude	1,900	30	1.23
Persian Gulf	Japan	Crude	1,750	44	1.48

*Aug. 2009 average.
Source: Drewry Shipping Consultants Ltd. Data available in OGJ Online Research Center.

Waterborne Energy Inc. US LNG imports

Country	July 2009	June 2009	July 2008	Change from a year ago, %
	MMcf			
Algeria	0	0	0	—
Egypt	20,140	17,300	6,420	213.7
Equatorial Guinea	0	0	0	—
Nigeria	2,930	0	0	—
Norway	5,770	2,910	0	—
Qatar	0	0	0	—
Trinidad and Tobago	15,290	33,940	24,550	–37.7
Total	**44,130**	**54,150**	**30,970**	**42.5**

Source: Waterborne Energy Inc.
Data available in OGJ Online Research Center.
Data not available at press time.

Propane prices

	July 2009	Aug. 2009	July 2008	Aug. 2008
	¢/gal			
Mont Belvieu	75.15	90.57	186.15	165.09
Conway	62.85	64.80	176.36	158.42
Northwest Europe	78.67	89.22	186.84	162.61

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

Muse, Stancil & Co. refining margins

	US Gulf Coast	US East Coast	US Mid-west	US West Coast	North-west Europe	South-east Asia
	$/bbl					
Aug. 2009						
Product revenues	85.96	80.59	82.72	83.26	80.05	76.55
Feedstock costs	–78.59	–74.16	–72.48	–66.93	–74.55	–75.53
Gross margin	7.37	6.43	10.24	16.33	5.50	1.02
Fixed costs	–2.14	–2.48	–2.41	–2.81	–2.41	–1.87
Variable costs	–1.33	–1.04	–1.22	–2.15	–3.28	–0.97
Cash operating margin	**3.90**	**2.91**	**6.61**	**11.37**	**–0.19**	**–1.82**
July 2009	3.62	1.58	7.04	9.96	–0.59	–1.66
YTD avg.	3.99	1.78	6.66	11.94	1.96	–0.23
2008 avg.	9.09	3.04	11.53	13.16	6.35	3.07
2007 avg.	12.60	6.65	18.66	20.71	5.75	2.25
2006 avg.	12.54	6.38	14.97	23.64	5.88	0.90

Source: Muse, Stancil & Co. See OGJ, Jan. 15, 2001, p. 46
Data available in OGJ Online Research Center.

Muse, Stancil & Co. gasoline marketing margins

July 2009	Chicago*	Houston	Los Angeles	New York
	¢/gal			
Retail price	267.51	245.77	288.78	271.29
Taxes	54.57	38.40	58.71	50.09
Wholesale price	193.87	184.13	211.82	192.36
Spot price	180.28	173.66	189.94	178.86
Retail margin	19.15	23.24	18.25	28.84
Wholesale margin	13.59	10.47	21.88	13.50
Gross marketing margin	**32.74**	**33.71**	**40.13**	**42.34**
June 2009	27.59	22.62	28.98	27.42
YTD avg.	22.48	21.18	18.21	27.78
2008 avg.	33.11	32.15	27.22	41.81
2007 avg.	26.96	23.12	19.05	31.10
2006 avg.	19.74	19.94	18.03	27.90

*The wholesale price shown for Chicago is the RFG price utilized for the wholesale margin. The Chicago retail margin includes a weighted average of RFG and conventional wholesale purchases.
Source: Muse, Stancil & Co. See OGJ, Oct. 15, 2001, p. 46.
Data available in OGJ Online Research Center.
Note: Margins include ethanol blending in all markets.

Muse, Stancil & Co. ethylene margins

	Ethane	Propane	Naphtha
	¢/lb ethylene		
Aug. 2009			
Product revenues	39.04	65.28	82.90
Feedstock costs	–20.91	–48.37	–97.55
Gross margin	18.13	16.91	–14.65
Fixed costs	–5.38	–6.36	–7.19
Variable costs	–3.04	–3.51	–4.59
Cash operating margin	**9.71**	**7.04**	**–26.43**
July 2009	9.71	7.04	–26.43
YTD avg.	14.14	10.84	–14.11
2008 avg.	21.00	22.89	–5.91
2007 avg.	14.41	14.14	–7.42
2006 avg.	19.54	22.45	1.36

Source: Muse, Stancil & Co. See OGJ, Sept. 16, 2002, p. 46.
Data available in OGJ Online Research Center.

Muse, Stancil & Co. US gas processing margins

Aug. 2009	Gulf Coast	Mid-continent
	$/Mcf	
Gross revenue		
Gas	3.02	2.63
Liquids	0.97	2.14
Gas purchase cost	3.36	3.54
Operating costs	0.07	0.15
Cash operating margin	**0.56**	**1.08**
July 2009	0.41	0.90
YTD avg.	0.30	0.87
2008 avg.	0.45	1.61
2007 avg.	0.44	1.47
2006 avg.	0.26	0.97
Breakeven producer payment, % of liquids	39%	47%

Source: Muse, Stancil & Co. See OGJ, May 21, 2001, p. 54.
Data available in OGJ Online Research Center.

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Obama team sheds green-job leader but keeps his ideas

The imprudence over which Van Jones lost his job should not divert attention from the conviction that had propelled him into the administration of US President Barack Obama.

Jones resigned Sept. 6 from his position as special adviser for environmental jobs following reports about politically indelicate utterances in his past.

His resort to vulgarity to describe

The Editor's Perspective

by Bob Tippee, Editor

Republicans caused some concern—although it was hardly unprecedented.

More damaging was his signature on a 2004 petition suggesting that the administration of former President George W. Bush allowed the attacks of Sept. 11, 2001, to occur so as to have an excuse to wage war on Iraq. After disclosure of that indiscretion—which supporters incredibly attributed to failure to read before signing—Jones looked irretrievably radical.

Conservatives, led by television analyst Glenn Beck, hyped the image in what Jones, to no help to himself, branded at the time of his resignation as "a vicious smear campaign against me."

The worst part of the affair is that the Obama camp has shed itself of Jones but not of the commitment he embodied to "green jobs." Before his brief career in federal government, Jones had attracted attention for his work linking environmentalism with advocacy for the poor.

In his vision, the government creates green jobs that simultaneously lift unemployed people out of poverty and save the planet. While the vision glitters with sales appeal, it can't work. Its assumptions about the link between environmental progress and employment are specious.

Government jobs require money diverted from private enterprise by taxation. That money can't be spent on private-sector salaries. And green employment is the core rationale for heavy subsidization and forced sale of energy too costly otherwise to compete.

Economic theory questions the effectiveness of work programs rooted in noncommercial energy. Experience, documented recently in a Spanish study noting the loss of 2.2 jobs for every renewable-energy position financed by government, substantiates the doubt (OGJ, Apr. 20, 2009, p. 64). Costs and inefficiencies make governmentally sponsored green employment a net job destroyer.

Jones and his former boss do the poor no favors by insisting otherwise.

(Online Sept. 11, 2009; author's e-mail: bobt@ogjonline.com)

Market Journal

by Sam Fletcher, Senior Writer

Surprise rally in gas prices

A four-session natural gas rally from a 7-year low culminated with a 15% jump past $3/MMbtu Sept. 10—the largest 1-day gain in almost 5 years in the New York market. The October contract closed at $3.26/MMbtu, up 42.7¢ for the day on top of an earlier 35% surge through the three previous sessions.

In Houston, analysts at Raymond James & Associates Inc. reported, "While most economic indicators are pointing towards a quicker-than-expected rebound from the recession (and consequential snap-back in industrial demand), with 8 weeks left in the injection season and [US gas] storage levels already at 3.4 tcf, a record high for this time of year, it is hard to see the move as anything other than a technical rally."

In New Orleans, analysts at Pritchard Capital Partners LLC said, "The gain was driven by short covering as shorts came to the realization that natural gas makes a seasonal low in September and tends to rally through the winter months." Another "bullish indicator" is that in the first and second quarters, "89% and 96% [respectively] of all wells drilled were completed vs. an average of 85% the previous six quarters; we believe that the inventory of drilled but not completed wells is relatively insignificant at this time and the 1,900 uncompleted well inventory from fourth quarter 2008 has declined significantly," they said.

Adam Sieminski, chief energy economist, Deutsche Bank, Washington, DC, said, "At the current rate of increase, we believe [gas] storage is nearly certain to exceed the all-time high of 3.565 tcf reached in late October 2007." As a result, he said, "The strong rebound in US natural gas prices this week will therefore be difficult to sustain."

Sure enough, the rally ended Sept. 11 when the contract dropped to $2.96/MMbtu, perhaps marking the end of buying to cover short positions, Pritchard Capital Partners said. However, they said, "Meaningful declines in natural gas supply from reduced production and higher demand should cause natural gas prices to spike in the first quarter of 2010." Gas prices were up in early trading Sept. 14.

CFTC changes

The US Commodity Futures Trading Commission's plan to divide investors into "more precise" categories to improve transparency in the commodities market includes "some flaws that could lead to wrong trading conclusions if the data is not properly analyzed," said Olivier Jakob at Petromatrix, Zug, Switzerland.

CFTC's "Disaggregated Commitment of Traders" report covers 22 different commodities, "but not all of them," Jakob warned. The CFTC plans to extend coverage to more commodities in the coming months. "But energy traders need to consider that the new report while it covers the InterContinental Exchange's West Texas Intermediate [positions] does not cover the WTI financial futures," he said.

On Sept. 8, Jakob said, "Large speculators are net short 24,813 WTI financial contracts so excluding them from the new report will overestimate the net length and price impact of large speculators." Likewise, he said, the report does not cover the natural gas swaps-on-futures. "Large speculators are net short in natural gas futures but net long in natural swaps-on-futures; hence the...report will overestimate the net short of large speculators in natural gas."

The "main interest" of the report is that it breaks down what was previously the "old commercial" category into producer, merchant, processor, and user—"a category that uses futures to hedge their commercial activities and that we will qualify as real 'commercial' and 'dealers' that use futures to hedge swaps exposure (i.e., the provider of a commodity index but as well a bank offering hedging through swaps to a commercial entity)," Jakob said.

However, he said, "The 'old noncommercial' category (what we call the large speculators) is split between 'money managers' (defined as commodity trading advisors, commodity pool operators, and hedge funds identified by the CFTC regardless if they are registered) and 'other reportables,' a category that includes other nonidentified speculators." Jacob said, "This means that true hedge funds are likely to find their positions mixed between the money managers and the other reportables. We can not read much in that split (i.e. money managers are net long and other reportables are net short in WTI), and we think that the old aggregated numbers for the large speculators leads to a better read of the financial flows."

Therefore, Jakob said, the Petromatrix analysis of the disaggregated report will merge the money managers and other reportables into one large speculator category "until the CFTC can provide a better definition of other reportables."

(Online Sept. 14, 2009; author's e-mail: samf@ogjonline.com)

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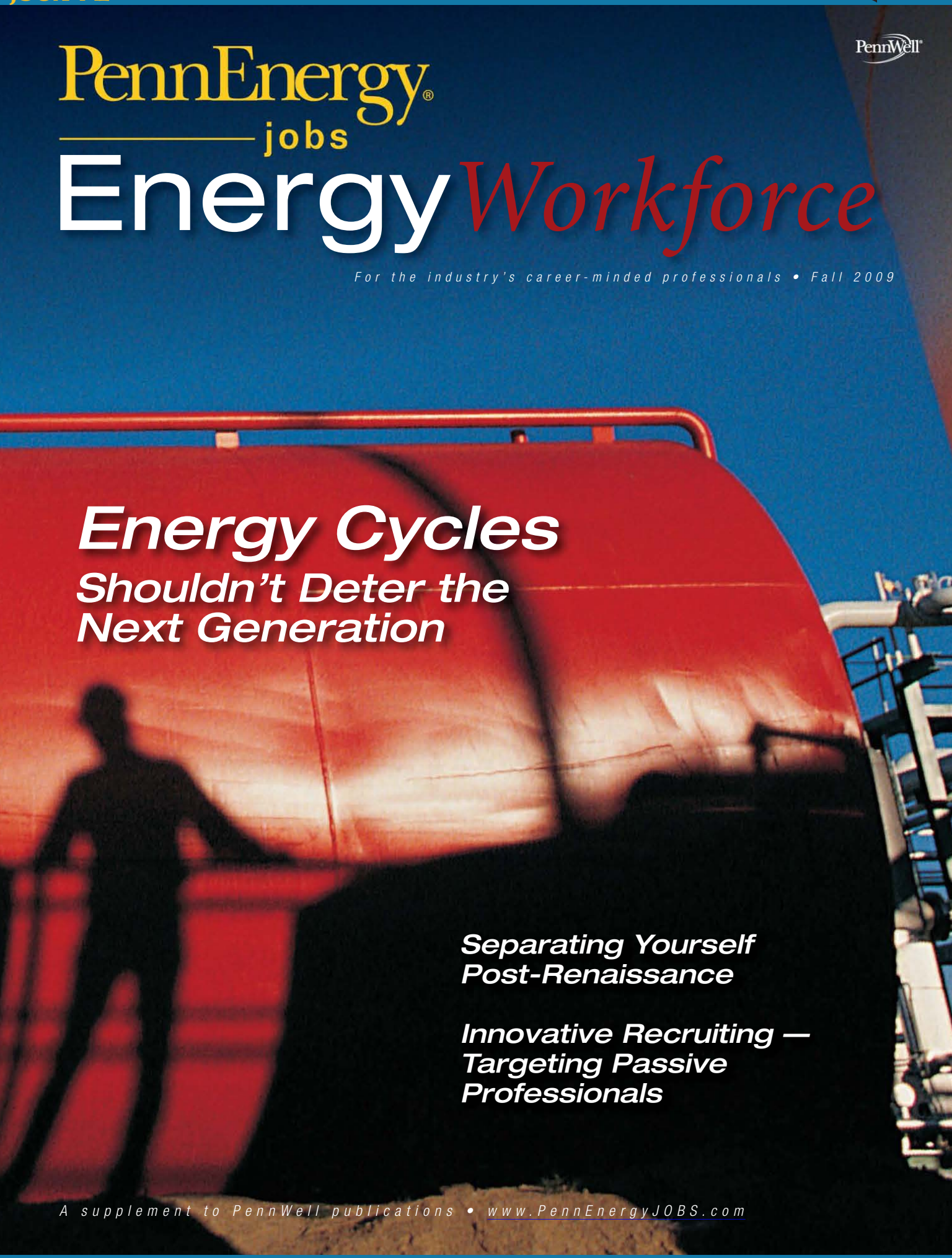

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Networking To Top Talent OR Networking Your Way to Top Talent

It would seem that during an economic slump, finding employees would be one of the easiest tasks. The truth is, finding top talent is still quite difficult.

An unemployment rate over 9% means companies are sifting through an even larger sea of unemployed people to find their talent. Unfortunately, many employers are still working within the status quo of hiring methods. It is commonplace to post a job, wait for the resumes to pour in and select talent based on those resumes. As the old saying goes, "work smarter not harder." Updating the recruitment strategy is a crucial step to increasing the number of talented individuals joining your company. So what should your new strategy look like? It is actually not a novel approach at all. Your strategy should be about leveraging the art of networking. Although many talk about the importance of networking, it is still a second rate practice in most organizations.

Networking should be an ongoing activity regardless of whether or not you currently have a position open. It is important to build up your arsenal of identified talent for openings you have now and in the future.

One efficient way of networking is through social networking sites such as LinkedIn. Social networking has become popular in the last couple of years, but its benefits are not being maximized to the fullest. Targeted searches should replace posting openings as the most used recruitment practice. Strategically recruiting top talent includes identifying potential candidates with similar skills, experience and even industry experience. Networking technology puts important information at a hiring manager's fingertips.

A second important type of networking is through face-to-face events. Face-to-face meetings give a recruiter or hiring manager one more dimension of detail. Job fairs are certainly one way of face-to-face networking, but they are really only one step up from sifting through resumes. A more effective networking strategy should include industry events. Just like online targeted recruitment, industry events provide an entire pool of potential candidates from a given industry. HR and hiring managers should become skilled at observing and evaluating people at these events; as if watching on-the-job interviews in progress.

Many of the people you target at these events will be gainfully employed and may not be looking for employment. Do not let this be a discouraging factor. Everyone is willing to hear about an opportunity. This opens the door to a long-term connection. There will also be some individuals actively seeking out new employment at conferences and tradeshows. Pay attention to this active candidate pool as well. If they are trying to get in front of you at an event, they are more savvy than the person who did nothing more than apply to an advertisement.

Networking should be an ongoing activity regardless of whether or not you currently have a position open. It is important to build up your arsenal of identified talent for openings you have now and in the future. The quality of individuals you identify through networking will be greater because you have not limited your pool of candidates to only those who apply.

Sincerely,
Stanna Brazeel,
Manager, Staffing and Salary Administration, Human Resources
PennWell

OP-ED

Separating Yourself Post-Renaissance

By Jason McAuliffe, ERI

When I received a call from PennEnergy about writing a short article on the current employment landscape in the Refining Sector, I thought to myself, "oh boy, this isn't going to pretty." If asked to write on the same subject this time last year or in 2007, I may have declined because of our workload. The perfect storm that led to the boom in refining investment and expansion earlier this decade would be a great article to write, but maybe next time. While my eternally optimistic personality hopes we see a resurgence in the *Golden Age of Refining*, it is more realistic to conclude that the renaissance the industry experienced earlier this decade will be a subject we wax nostalgic about with our children.

About the Author

Jason McAuliffe is President and CEO of ERI. Jason graduated from Texas A&M University at Galveston, where he studied Environmental Sciences and earning his Bachelor of Science degree in both Marine Biology and Marine Fisheries. Since then he has spent 8 years within the petroleum industry and regulatory agencies.

ERI is an Executive Search Firm for a wide array of industries. The origins of ERI were in the petroleum industry, serving clients engaged in refining and retail marketing activities. Today, ERI's practices include energy, consumer product goods, retail, hospitality and healthcare.

The aptly dubbed "meltdown" that set in late last year and its lingering aftermath has continued to weigh on the refining sector. From 2001 to 2008, refiners were printing money with fat margins on gasoline & diesel and major integrated oil companies were even happier with the crude run up to $140+/bbl. Most refiners were investing in their physical and people assets. Mandates for Ultra-Low Sulfur Diesel, ethanol as oxygenate and environmental upgrades became an acceptable cost of doing business. All of these investments created an intense demand for a wide variety of engineering and economic disciplines. These were good times.

Today's look is that while crude oil has backed off 50 percent from the historic high prices of last year, the demand destruction caused by refined products prices has held firm. Bottom line? There is little margin in the complex manufacturing process of refining, and where you cannot find margins, there is little support for investment. Welcome back to the good old days, when the refining business was not a profit center…make money on the crude, process at near cost, then make money on the sale of taking the product to market.

The demand in today's refining job market is about maintaining assets. There is a fair amount of hiring taking place for disciplines of reliability, maintenance, safety, instrumentation, and process controls. We have seen little movement in roles pertaining to design, planning, and construction of new units, which undoubtedly is the result of major expansions being shelved if there was room to walk away. What to expect moving forward? The industry's current players will either rationalize the sale of assets or will hang on with minimal investment until the market firms up and demand is on a consistent upswing. Pressures from overseas refiners will put further short and mid-term pressure on domestic refineries to cut costs or divest marginal assets. We may see assets sold, but the counterparty is likely to run the business with rational expectations for return on investment and will need the best people to extract every penny. The question for professionals seeking opportunities in today's and tomorrow's refining industry is how to separate yourself from the crowd.

Eighty percent or better of experienced professionals will find their next career opportunity through a peer network or industry association. When you add in those who find employment by applying directly to a company (e.g., dropping off a resume or applying online), you probably cover 95 percent. If you are in the unfortunate situation of being unemployed, find a passion in networking or you will be relying on fate. Applying through a website is easy but you

Continued on page 7

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Energy Cycles Shouldn't Deter the Next Generation

Why we still need to invest in future workforce staffing needs

By David Dunlap, BJ Services Company & Steve Nance, Steele Creek Investment Company

The current commodity price doesn't change things. As more petroleum specialists reach retirement age, we need bright, innovative minds to enter the business to help us meet the energy needs of the future.

What has been referred to as the "Great Crew Change" will happen irrespective of high or low commodity prices. Now, more than ever, our industry needs to focus on ensuring that we keep a stream of new talent interested in entering our workforce so we can meet the technical and environmental challenges facing our national and global energy needs.

The fourth annual Industry Salute to Interns event, held on July 21, 2009, provided an excellent opportunity for industry representatives to meet with students who have demonstrated a specific interest in a career in the oil and gas industry. Students employed during the summer by Apache, Chevron, El Paso, Halliburton, Noble Energy, Red Arrow Energy, Sanchez Oil & Gas, Schlumberger and Shell participated in this one-day event in Houston, hosted by the Offshore Energy Center.

The central theme of this year's event was the future of the industry, in light of the dramatic changes in oil and gas prices, and the impact of the current economic crisis on hiring and job opportunities. Presentations and panel discussions during the day reinforced the message that the future of our industry is bright, and opportunities for motivated and talented people in our industry are tremendous.

Salute co-chairs were presented information and fielded questions regarding the fundamentals of the energy industry and the importance of hydrocarbons in the long-term global energy future. Robert Drummond of Schlumberger, Anthony Gallegos of Scorpion Offshore, Darrell Hollek of Anadarko, and John Kelly of El Paso Exploration & Production Company participated in a discussion in which each panelist described their company's strategies in the current market environment and the impact of these strategies on future manpower requirements.

In addition to the panel, Laura Schilling of Halliburton and Libby Cheney of Shell discussed career path options and offered advice on how students can proactively manage their career and ultimately get into their "dream job."

The event included entertaining and informative presentations from Jan Hargrave and Marilyn Moats Kennedy who discussed body language and the challenges of communicating across generation lines.

Questions asked by the interns at this year's Industry Salute event centered on the future of the oil and gas industry. Most interns are aware of workforce reductions that have occurred in the industry during the past year and a "boom-bust" perception of the industry still exists.

Presentations and discussions during the day put this question at the forefront and attempted to provide information to these students to calm their concerns about the long-term opportunities in the oil and gas industry.

In the end, the message conveyed during this event was this: The energy business is indeed a great place to pursue a career. Yes, this is a cyclical business. There have been cycles before and we will encounter cycles in the future. But there is always a great career in our industry for people who are motivated and willing to work hard.

A tremendous number of professionals in this industry will retire over the next 10 to 15 years and the future is extremely bright for talented individuals who enter the energy business. In addition to oil and natural gas, we need all types of energy professionals to meet our future needs. We need highly skilled technical people to help unlock the resources, both renewable and non-renewable, to meet future demand. We need people focused on integrity, leadership and involvement in professional societies and their communities.

The current economic environment coupled with recent increases in supply will be short lived when looking at the macro energy supply and demand picture. Companies have reacted differently to the recent drop in commodity prices. Virtually everyone has cut back on activity levels as evidenced by the dramatic drop in North American drilling rig activity. Today, many companies are focused on production optimization programs and developing

inventory for the inevitable upturn in prices. The greatest challenge these same companies face is having an adequate workforce to support this activity when that recovery begins.

There is no question that hiring interns and new employees has slowed for most, if not all, companies during the past 12 months. We need to be careful that we don't let the pendulum swing too far and exacerbate the workforce issue facing our industry as many reach retirement age over the next few years.

Hats off to the Offshore Energy Center and in particular, Sandra Mourton, the Executive Director, for hosting such a great event. As an industry, we need to maintain efforts to continue to attract talent and encourage students to seek careers in oil and gas and once again the Industry Salute to Interns event proved to be a great opportunity to convey this message. —EW

About the Authors

David D. Dunlap is Executive Vice President and Chief Operating Officer of BJ Services Company. He originally joined BJ Services in 1984 and served in a variety of engineering, operations, and management positions until 1995, at which time he became President of the International Division. Dunlap was appointed Executive Vice President and Chief Operating Officer in March 2007. He serves on the Texas A & M Petroleum Engineering Industry Board, the Texas Tech University Petroleum Industry Advisory Board, The John Cooper School Board of Trustees, and the Board of Directors of The Cynthia Woods Mitchell Pavilion. Dunlap received a BS in petroleum engineering from Texas A & M University in 1984.

BJ Services Company is a leading provider of pressure pumping, well completion, production enhancement and pipeline services to the petroleum industry.

Steven W. Nance is President and Sole Director of Steele Creek Investment Company, a personal investment vehicle primarily for oil & natural gas business ventures. Mr. Nance was President of Peoples Energy Production Company until its sale in 2007 to El Paso Exploration & Production Company. He has previously worked for The Superior Oil Company, Mobil Oil, Meridian/Burlington Resources and Xplor Energy. He has been recognized as a Distinguished Engineer at Texas Tech University, serves on the Petroleum Industry Advisory Board at Texas Tech, the Independent Petroleum Association of America, Southeast District Board of Trustees, the Cypress Woodlands Junior Forum Business Advisory Board and the Board of Directors for The Center for the Performing Arts at the Woodlands. Mr. Nance received a BS degree in petroleum engineering from Texas Tech University in 1978.

Steele Creek Investment Company is a private entity that invests primarily in the oil & natural gas business.

We encourage your feedback on this or any PennEnergyJOBS EnergyWorkforce article. Please send your comments to feedback@PennEnergyJOBS.com

Continued from page 4

will likely find a better response trying to communicate with office furniture. I have seen hundreds of good articles on networking and networking etiquette so learn them and live them. Find out where your hired peers were found and establish yourself there, whether it be a trade association, social networking site, or coffee shop. Luck favors the prepared.

For a final word and note on my beloved, albeit sometimes misunderstood, profession: recruiters do not place many people… I repeat, recruiters do not place many people. Recruiters spend 90 percent (or better) of their time searching for professionals that have a very specific background and experience in a particular discipline. Find the recruiter(s) that are the best in your industry and befriend them. Mental note: "befriend" and "stalk" are two very different concepts (research networking etiquette). Experienced recruiters *love* to network and hopefully they will make some time for you. My final word for today is to not let fate determine your future. The worst time to plan your future is when you are in the situation that forces you to. Be proactive and manage your own brand. —EW

Innovative Recruiting- Targeting Passive Professionals

By Evan Cohen, EVCO

As an HR professional, you might notice that the recruiting landscape is changing rapidly and that there is an immediate need to shift your approach when recruiting employees. In order to stay ahead of the curve and remain competitive, HR management and recruiting professionals must develop strategies to address these challenges. Two such strategies include:

1. Defining your company's description of a "qualified-best match" candidate.
2. Developing the best strategy for targeting and recruiting the best candidate, which is typically the top performing industry professional.

A "Qualified-Best Match"

This process starts with articulating exactly who your ideal candidate is.

With a systematic approach to candidate profiling, you should be able to identify the hard and soft skills, experiences and attitudes, education and background that a candidate should possess—traits that will ultimately translate into a top performing employee.

One way to identify your "best match candidate profile" is by interviewing your current top performers and isolating the common traits that they all share.

Once you know exactly the type of candidates you are looking for, you can begin to identify where you might find them.

The Difference Between Active and Passive Candidates

Active job seekers are motivated by any number of circumstances, are not *necessarily* working, and are typically easier to find; that is, they probably have their resume posted on a few job boards, are leaning heavily on their network of professional associates to assist them in their search, and are calling companies directly to learn about current and future opportunities of employment.

Passive candidates are typically employed and satisfied with their employer and are content in their current role. That is not to say that if the right opportunity presented itself, they would not be interested in learning more. However, they are most likely not out in the field broadcasting their desire to find a new opportunity. These professionals are probably looking to move a bit slower, will have more questions, and will likely be a bit more hesitant to risk leaving a good job for a new challenge and increased risk.

Active and Passive candidates are not different people with different skills sets and abilities. Candidates from one group are not necessarily any better or worse than the other, they are just at different points in their employment cycle.

Candidate interest and availability can be quite dynamic and is dependent upon a number of factors. Changes in current management, workloads or personal circumstances can accelerate the transition from passive to active candidate. In extreme cases, layoffs, natural disasters, lost contracts and other forms of sudden shifts can lead this to happen overnight.

That being said, the true measure of your best candidate has less to do with her state in seeking out a job, and more to do with how she measures up to your company's "best match" candidate profile.

The Search Begins: Your Strategy for Targeting and Recruiting the Best Candidate

Why is it important to continuously search for both types of candidates? To keep your candidate pipeline full! Successful recruiters continually source both Active and Passive candidates to ensure a wider pool from which to choose. Doing so ultimately results in reducing the time-to-fill and the cost per hire.

Active candidates typically will come to you, either by applying directly for your positions, which may be posted on a job board or corporate career site, or by placing a direct call to your office. These inbound responses are easier to manage because usually, the candidate has a working knowledge of your company and is interested in joining the team. The only "selling" that has to take place on the recruiter's behalf occurs during the compensation negotiation. Other than that, the candidate rarely offers an objection to submitting an updated resume or scheduling phone and face to face interviews.

Passive candidates are typically more difficult to find, so sourcing a passive industry professional requires more investigating through phone calls, referrals from network partners and consistent and persistent relationship-building.

Professional recruiters are adept at being able to manage both responsibilities: maintaining a steady flow of active candidates to fill immediate needs, and establishing strong industry relationships that yield passive candidate results over time. By focusing on both types of candidates, the disruption caused by vacancies can be minimized, and sometimes avoided altogether. In addition, by making proactive attempts to network, you are creating a competitive advantage by spreading the message that you represent an employer of choice within your industry.

The challenge that HR professionals and their recruiters face is that they source and recruit both types of candidates using the same approach.

The 5 Steps of Getting to "I accept!"

To attract the top performing passive industry professional, HR managers must work closely with their recruiters to develop and deliver the right message with the right frequency to keep their company and current opportunities at the top of their target candidate's mind. That way, when the time is right and the candidate is open to exploring new opportunities, her first call is to the recruiter with whom she has an established, long term relationship.

Once you identify your best match passive candidate, you must provide her with the information she needs to evaluate an opportunity objectively. When done correctly, you will use a series of different recruiting and information-sharing approaches and will move the candidate smoothly along a path of increasing knowledge and interest until ultimately, she decides to make the move.

The following steps will guide you in ensuring that you stay on track through the process:

- **Hold an information-gathering session.** Use your first conversation to open dialogue and learn about interested individuals as potential candidates. Have them tell you a little about themselves first. Don't go too fast, even if the match seems perfect. Provide the person with a brief, high-level overview of the job, and schedule an exploratory call sometime later. Be a bit vague, and mention the importance of the job to the company's strategic direction. This approach also gives you the option of networking with the candidate and meeting with professionals they feel are top performers.

- **Shift decision-making from a short-term emphasis to a more long-term one.** The basic goal of the preliminary discussions is to have the candidate consider the strategic and tactical issues associated with making a change and accepting a new opportunity. Too often, candidates lose interest and opt out early because the recruiter did not effectively communicate the short-term goals and the long-term growth opportunities. Understanding the candidate's needs and balancing the correct message will give a candidate enough short-term information to understand how she can make an immediate impact and enough long-term information to get her excited about future projects and goals.

- **Don't rush the process.** Passive candidates need time to absorb the information you provide. While you can try to speed the process along, you don't ever want to come across as being desperate. Ask questions and listen. If you're talking too much, you're pushing. It's better to find out what the candidate would need to know to move to the next step in the evaluation process. Scheduling an informal meeting, such as a lunch date, is a great way to build your relationship and understand what she is currently doing, and what underlying concerns or questions you will need to address as your recruiting process continues.

- **Create competition.** Of course, the goal of this exercise is to move this professional from candidate status to applicant status as quickly as you both deem appropriate. Once you are sure this candidate is a top professional and you have addressed her major concerns, it is time to create a sense of urgency. A great way to do this is by informing the candidate that there are a number of professionals showing great interest in the opportunity, but you consider her to be a top candidate. Remember, a great job is always better when there's competition.

- **Set the table.** Invite the candidate to the office to meet the team. In sports, as in recruiting, nothing is more important and beneficial than utilizing the home court advantage. When every employee the candidate will meet with works together and understands her role in the recruiting process, the candidate will have a true understanding of the company's culture and atmosphere and will be better equipped to make the decision to join the organization.

When recruiting passive candidates, use a professional, step-wise approach to provide them with small doses of information that keep them engaged. You will know you're successful when the candidate starts asking you more questions, calls to see how the interview went, or asks about the other candidates.

In time, the information you provide will be enough for the candidate to realize that this is an opportunity worth pursuing, so be aware, maintain control and be ready to move the process towards closure.

Keep in mind, when the demand for talent outstrips the supply of candidates, you are most likely to find the largest number of top performing professionals among the ranks of passive candidates. So maintain your relationships, ask for referrals and always be recruiting! —EW

About the Author

Evan Cohen, President of EVCO Recruiting, offers more than 10 years experience assisting companies with creating innovative talent management and recruiting strategies. Evan Cohen earned a Bachelor of Arts degree in Communications from California State University, San Marcos, a Human Resources Professional Certification from University of California, San Diego, and is AIRS certified. Mr. Cohen may be reached at Evan@EvcoRecruiting.com.

EVCO Recruiting has developed an aggressive recruiting formula resulting in the creation of a high performance fully scalable, turn- key recruiting solution for direct manufacturers, suppliers and indirect service providers within the Energy industry. Visit www.EvcoRecruiting.com and www.BigGreenBoard.com.

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December 8 – 10, 2009 ~ Las Vegas Convention Center Las Vegas, Nevada USA

Sunday, December 6, 2009 – COMPETITIVE POWER COLLEGE Pre-Conference Workshops						
8:00 AM – 5:00 PM	CPC 101 Room N102 Basic Gas Turbine Metallurgy and Component Repair		CPC 102 Room N103 Understanding Fossil Power Plant Performance Using First Principles Models		CPC 103 Room N107 An Introduction to the Design, Operation and Evaluation of Parabolic Trough Solar Power Plants	
Monday, December 7, 2009 – COMPETITIVE POWER COLLEGE Pre-Conference Workshops					**HALF-DAY WORKSHOPS**	
8:00 AM – 5:00 PM	CPC 301 Room N103 Capital Project Analysis at Power Plants	CPC 302 Room N107 Essential Practices for Outage Management	CPC 303 Room N108 Turbine Generator Failures: Prediction and Prevention	CPC 304 Room N111 Lost Efficiency: Finding "Low Hanging Fruit"	8:00 AM – 12:00 PM	CPC 501 Room N101 Why Good Projects Don't Get Built
Tuesday, December 8, 2009						
9:30 AM – 11:30 AM	***OPENING KEYNOTE ADDRESS*** *Las Vegas Hilton* *Barron Room*	**Mr. Michael Yackira** **President and Chief Executive Officer** **NV Energy**				
Conference Tracks & Sessions	**Industry Trends / Competitive Power Generation I** **Room N109**	**Industry Trends / Competitive Power Generation II** **Room N110**	**Environmental Issues I** **Room N103**	**Environmental Issues II** **Room N111**	**Fossil Technologies I** **Room N107**	**Fossil Technologies II** **Room N108**
1:30 PM– 3:30 PM	**Integrating Renewables with Thermal Generation – Panel Discussion**	**Streamlining Project Approval – Panel Discussion**	**NO_x Control: Issues and Strategies**	**Mercury Test Results and Issues**	**Modern Coal Plants & Design Developments**	**Material Handling Challenges and Solutions**
Wednesday, December 9, 2009						
7:30 AM – 9:00 AM	**Networking Breakfast – Ballroom C, Las Vegas Hilton**					
9:30 AM – 11:30 AM	**The Stimulus Plan's Effect Advanced Generation Technologies**	**Three Optimization Approaches to be Cost-Effective Today – Panel Discussion**	**Regulatory Issues and Environmental Compliance**	**CO_2 Abatement Strategies**	**How Carbon Capture Affects Plant Design**	**Biomass and Biomass Co-Firing Considerations in Coal-Fired Power Plants**
1:30 PM – 3:30 PM	**Renewable Electricity Standards and Their Impact on the Electric Power Industry – Panel Discussion**	**Smart Grid, Renewables Integration and System Security – Transmission Trends Affecting Power Generators**	**Advances in Multi-Pollutant Control Technology**	**Control of SO_2 and SO_3 Emissions**	**Pre- and Post-Combustion CO_2 Reduction Technologies**	**Innovations in Gasification and IGCC**
Thursday, December 10, 2009						
7:30 AM – 9:00 AM	**Networking Breakfast – Ballroom C, Las Vegas Hilton**					
9:30 AM – 11:30 AM	**Mega-Session** **Room N110**				**Mega-Session** **Room N112**	
	Preparing for the Upcoming CO_2 Capture / Sequestration Legislation – Panel Description				**Large Frame Gas Turbines**	

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	HALF-DAY WORKSHOPS			TWO-DAY COURSES
CPC 104 Room N108	1:00 – 5:00 PM	CPC 402 Room N101	CPC 403 Room N115	**8:00 AM – 5:00 PM each day**
Power Plant Construction Management – A Guide to Survival		Turbine Generator Torsional Vibration Failures	Intellectual Property Fundamentals for Renewable Energy Developers, Licensors and Licensees	

CPC 502 Room N102	1:00 – 5:00 PM	CPC 503 Room N101	CPC 504 Room N102	CPC 505 Room N113	**CPC 201** Room N109
Temperature measurement and Data Acquisition in Power Plants		Key Considerations and Best Practices in EPC Contracting for Wind Farms (Developer's Perspective)	Turbine Inlet Cooling: The Energy Solution to Increase Power Output, Lower Emissions, Decrease Carbon Footprint & Improve Heat Rate	Combustion Dynamics in Gas Turbine Power Plants	Heat Rate Awareness and Carbon Reduction

Mr. Pierre L. Gauthier
President & CEO
ALSTOM Canada Inc. and ALSTOM US Inc.

Mr. Keith Rattie
Chairman, President and CEO
Questar Corp.

Gas Turbine Technologies **Room N113**	**Renewable Energy I** **Room N112**	**Renewable Energy II** **Room N114**	On-Site Power **Room N117**	**Plant Performance I** **Room N101**	**Plant Performance II** **Room N102**
Gas Turbines – An O&M Perspective	**Biomass Market and Technology Developments**	**Utility-Scale Solar Power**	**Net Zero: Blending Technologies to Achieve Grid Independence**	**Performance Improvement Through Instrument, Control and Electrical Systems**	**Gas Turbine Inlet Cooling Improves Output and Emissions**
Combined Cycle Technology Update	**Wind Power**	**Emerging Clean Technology Innovations**	**How Distributed Energy Technologies will Integrate with Tomorrow's "Smart Grid" – Panel Discussion**	**Plant Maintenance**	**Steam Turbine Reliability, Availability & Efficiency**
Advances in Gas Turbine Technology	**Biomass Fuels for Power Generation**	**Energy Storage**	**The 2010 ESCO Model – How to Overcome the Capital Cost Hurdle – Panel Discussion**	**Asset Optimization**	**Combustion Optimization and Boiler Cleaning**

	Mega-Session **Room N114**
	Renewable Power Survival – Panel Discussion