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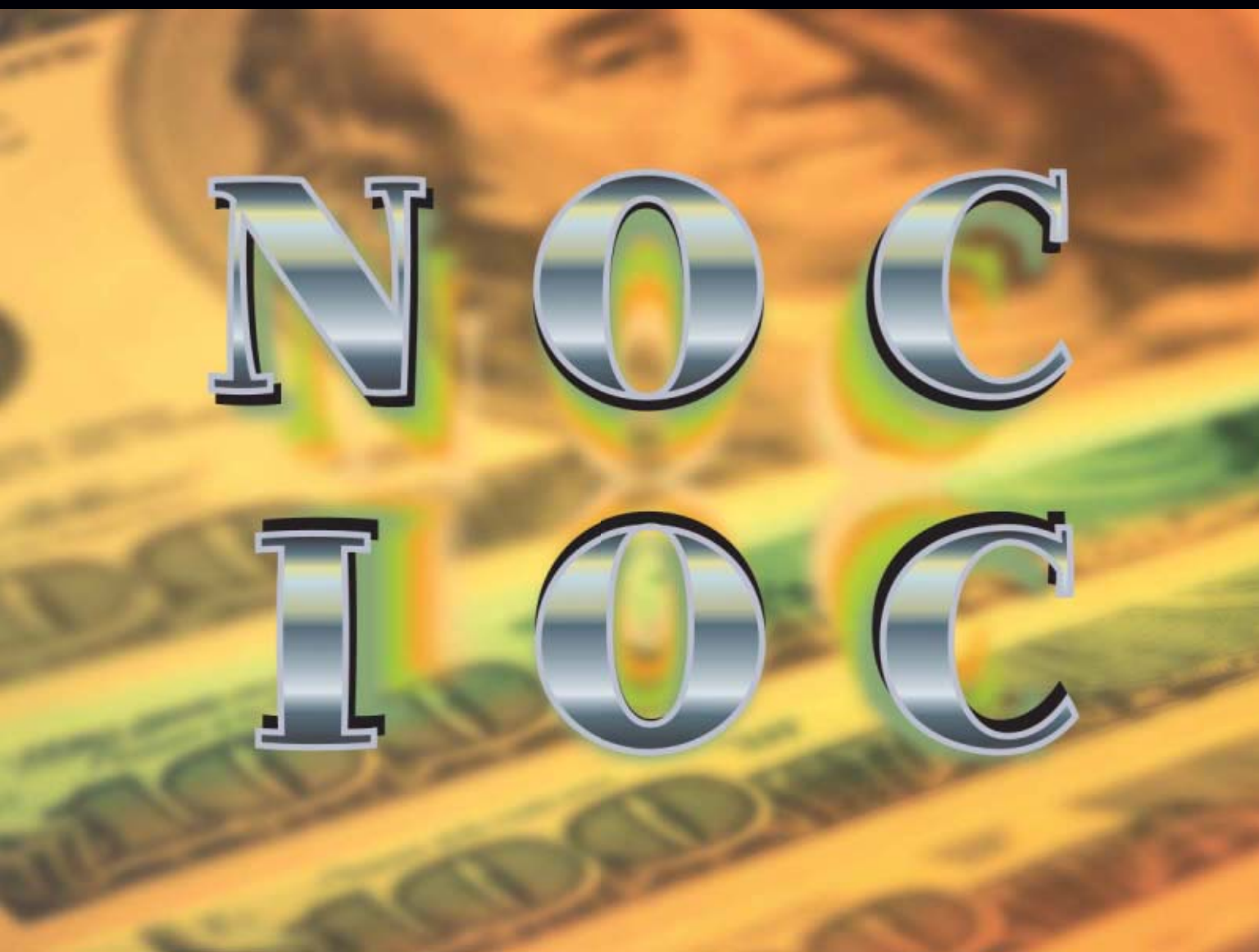

Oil Company Evolution

Tamar wildcat finds subsalt gas off Israel
BPZ Energy continues Corvina field drilling
Hurricanes, economic turmoil push olefins production lower
Testing eliminates crude line pour point depressant use

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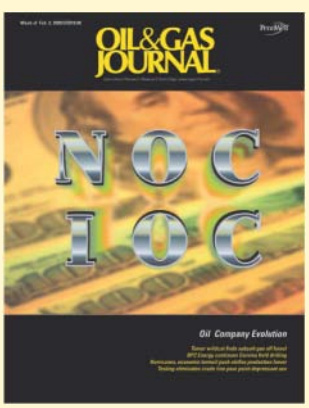
Feb. 2, 2009
Volume 107.5

OIL COMPANY EVOLUTION

REGULAR FEATURES

COVER

Over the past 30 years, the relationship between international oil companies and national oil companies has changed greatly. Where IOCs once dominated global exploration and production activities because of their expertise and advanced technologies, today NOCs control as much as 94% of global oil and gas reserves. Although there remain many joint ventures between NOCs and IOCs, there are more and more attempts to relegate IOCs to the position of hired contractors or to replace them with oil services firms. The article starting on p. 24—OGJ's special report on Oil Company Evolution—examines some of the challenges IOCs face today and actions they can take to maintain competitiveness.



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Feb. 2, 2009

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General Interest — Quick Takes

FERC issues first ROE order incorporating MLPs

The Federal Energy Regulatory Commission rejected a Kern River Gas Transmission Co. settlement on Jan. 15 in its first return-on-equity (ROE) order under its 2008 policy statement.

The commission found that Kern River's 12.5% ROE was excessive and would result in unjust and unreasonable rates. It determined that the ROE rate should be 11.55% based on the record established in a paper hearing on ROE established in an April 2008 order.

"The reason for including master limited partnerships [MLPs] in setting a proxy group is to assure an adequate sample for determining a pipeline's ROE and to obtain consistent regulatory results. The commission's role is to balance the interests of investors while protecting the ratepayer from excessive rates, and we have done so with this order," said FERC Chairman Joseph T. Kelliher.

FERC said the latest order also denied a request for rehearing, and rejected a contested settlement filed by Kern River, a subsidiary of MidAmerican Energy Holdings Co.

FERC said the allowed ROE rate was set at the median of a proxy group that included both MLPs and corporations in a pipeline rate proceeding for the first time. Based on its analysis, it said it determined that the ROEs for the five firms selected for the proxy group yielded a range of reasonable returns at 8.8-13%, with an 11.55% median ROE.

FERC directed Kern River to cancel its interim rates filed with the settlement and made effective on Oct. 1, and to make a revised compliance filing using an 11.55% ROE within 45 days of the new order. FERC also directed the interstate natural gas pipeline company to recapture interim refunds at the earliest possible date as required by the settlement.

Midstream JV planned for Marcellus shale

MarkWest Energy Partners LP and NGP Midstream & Resources LP plan to form a natural gas midstream services joint venture in the Marcellus shale.

Terms call for MarkWest to be operator and to own 60% of the JV. MarkWest will contribute $100 million of existing Marcellus assets to the venture.

NGP will invest the next $200 million of capital, which approximates the capital required to finance the project in 2009. Capital funding for 2010-11 will be driven by producer drilling programs.

Finalization of the JV remains subject to customary closing conditions.

MarkWest already provides Marcellus shale midstream services, including gathering and processing services for Range Resources Corp. in southwest Pennsylvania. By yearend, the midstream joint venture is expected to be capable of processing up to 240 MMcfd of gas for Range and other producers.

PNG LNG submits EIS, gathers public input

The ExxonMobil Corp.-led PNG LNG project group has taken another step towards development with the submission this week of its environmental impact statement to Papua New Guinea's Department of Environment and Conservation.

The 6,000-page tome draws on 26 supporting studies that took just over 18 months to complete. Planning began in April 2007 while field studies and data collection were carried out between November 2007 and July 2008.

The consortium also conducted two public consultation road shows in 2007-08 that each visited 35 villages throughout the proposed 700-km pipeline and infrastructure imprint.

The project venture's manager Peter Graham says the intention is to mitigate impacts on the environment and on affected communities by planning, building, and operating according to good industry practice as well as adhering to applicable government requirements and international environmental standards.

Following receipt and initial review of the document, the department will conduct a further public consultation road show in the next few months to canvas community feedback. Public release of the EIS is expected next month.

The PNG LNG Project involves construction of a two-train, 6.23 million tonne/year liquefaction plant near Port Moresby, with gas sourced from several fields in the southern highlands.

Interest holders are ExxonMobil with 41.6%, Oil Search 34.1%, Santos 17.7%, and Nippon Oil 4.5%. Landowner interests hold the remaining interests.

PNG's state-owned Independent Public Business Corp. is using its 17.56% holding in Oil Search to raise $1.68 million (Aus.) to fund the government's 19.4% of the project which, once applied, will reduce the interest held by the other partners. ✦

Exploration & Development — Quick Takes

EOG sees big volumes from Barnett combo play

EOG Resources Inc., Houston, sees a net recoverable potential of 227-463 million boe from a "combo" play in the Mississippian Barnett shale northwest of Fort Worth along the Red River in Montague and Clay counties, Tex.

Eight EOG horizontal wells and 60 other industry wells have confirmed an economically viable trap 40 miles east-west by 20 miles north-south. EOG holds 250,000 net acres in the area.

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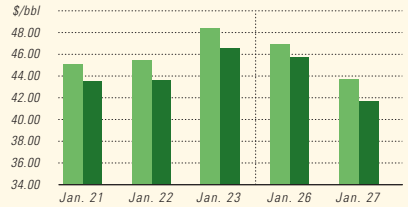
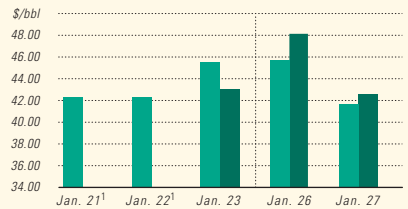
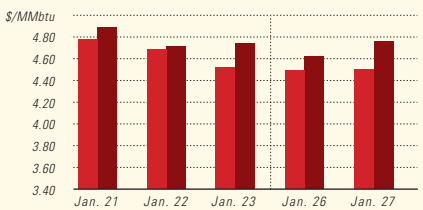


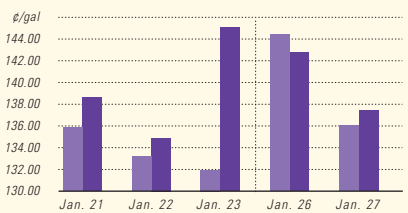
WTI CUSHING / BRENT SPOT



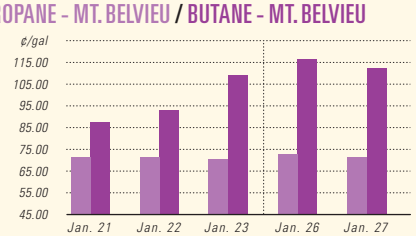
NYMEX NATURAL GAS / SPOT GAS - HENRY HUB



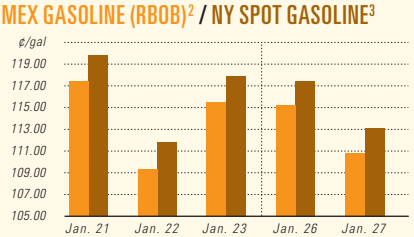
IPE GAS OIL / NYMEX HEATING OIL



PROPANE - MT. BELVIEU / BUTANE - MT. BELVIEU



NYMEX GASOLINE (RBOB)[2] / NY SPOT GASOLINE[3]



[1]Not available [2]Reformulated gasoline blendstock for oxygen blending.
[3]Nonoxygenated regular unleaded.

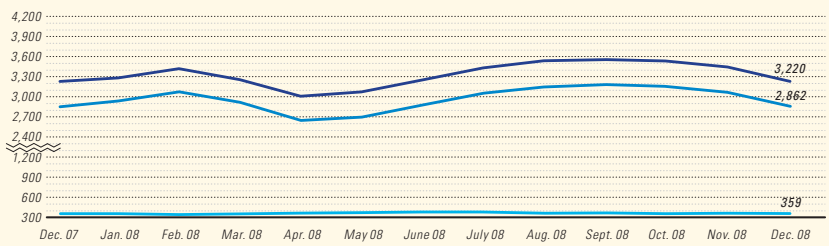
US INDUSTRY SCOREBOARD — 2/2

Latest week 1/16	4 wk. average	4 wk. avg. year ago[1]	Change, %	YTD average[1]	YTD avg. year ago[1]	Change, %
Demand, 1,000 b/d						
Motor gasoline	8,874	9,017	–1.6	8,796	8,814	–0.2
Distillate	4,091	4,202	–2.6	4,018	4,209	–4.5
Jet fuel	1,356	1,573	–13.8	1,380	1,546	–10.7
Residual	603	669	–9.9	580	672	–13.6
Other products	4,522	4,934	–8.4	4,416	4,873	–9.4
TOTAL DEMAND	19,446	20,395	–4.7	19,191	20,114	–4.6
Supply, 1,000 b/d						
Crude production	4,971	5,076	–2.1	4,968	5,093	–2.5
NGL production[2]	2,197	2,281	–3.7	2,354	2,123	10.9
Crude imports	9,832	9,924	–0.9	10,027	10,000	0.3
Product imports	3,268	3,280	–0.4	3,311	3,492	–5.2
Other supply[3]	1,483	1,310	13.2	1,284	1,056	21.6
TOTAL SUPPLY	21,751	21,871	–0.5	21,943	21,765	0.8
Refining, 1,000 b/d						
Crude runs to stills	14,418	15,254	–5.5	14,418	14,799	–2.6
Input to crude stills	14,860	15,251	–2.6	14,860	15,086	–1.5
% utilization	84.4	87.0	—	84.4	85.8	—

Latest week 1/16	Latest week	Previous week[1]	Change	Same week year ago[1]	Change	Change, %
Stocks, 1,000 bbl						
Crude oil	332,663	326,563	6,100	289,397	43,266	15.0
Motor gasoline	219,980	213,505	6,475	220,341	–361	–0.2
Distillate	144,957	144,167	790	128,543	16,414	12.8
Jet fuel–kerosine	38,429	37,973	456	39,752	–1,323	–3.3
Residual	36,057	34,742	1,315	38,540	–2,483	–6.4
Stock cover (days)[4]			Change, %		Change, %	
Crude	23.2	22.6	2.7	19.0	22.1	
Motor gasoline	24.8	23.9	3.8	24.0	3.3	
Distillate	35.4	35.2	0.6	30.0	18.0	
Propane	34.8	39.8	–12.6	26.8	29.9	
Futures prices[5] **1/23**			**Change**		**Change**	**%**
Light sweet crude ($/bbl)	43.11	36.91	6.20	91.53	–48.42	–52.9
Natural gas, $/MMbtu	4.66	5.07	–0.41	8.15	–3.50	–42.9

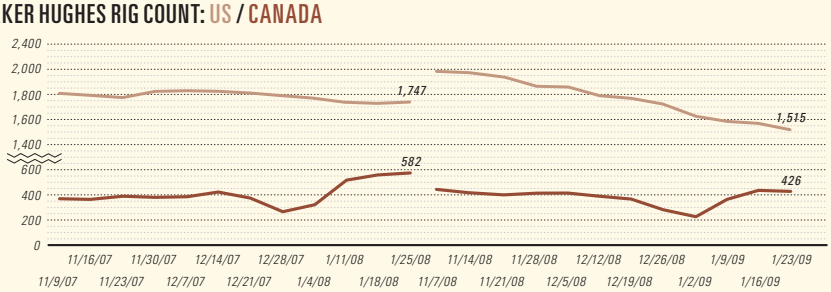
[1]Based on revised figures. [2]Includes adjustments for fuel ethanol and motor gasoline blending components. [3]Includes other hydrocarbons and alcohol, refinery processing gain, and unaccounted for crude oil. [4]Stocks divided by average daily product supplied for the prior 4 weeks. [5]Weekly average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

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



Note: Monthly average count

BAKER HUGHES RIG COUNT: US / CANADA



Note: End of week average count

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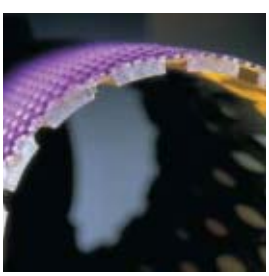

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EOG defines the area as primarily an oil play with added value from natural gas and natural gas liquids, the company said in a mid-January presentation. It estimates 33 million bbl/sq mile of oil in place and 115 bcf/sq mile of gas in place in eastern Montague County.

The company estimates per well net recovery potential at 75,000 bbl of oil, 34,000 bbl of NGL, and 260 MMcf of gas. A gas processing plant is expected to start up in February 2009, enabling the first major production volumes from the play.

Addax reports oil discovery in Nigeria

Addax Petroleum Corp., Calgary, plans to drill a downdip appraisal well to a two-zone oil discovery on the eastern OML 124 license in Imo state 105 km north of Port Harcourt, Nigeria.

The Njaba-2 well, formerly Okaka, cut four oil-bearing reservoirs that total 289 ft of gross oil column. The two main intervals are 149 ft and 115 ft thick at 990-1,050 m and contain 20-28° gravity oil. The license has facilities for early production.

Addax, with 100% working interest in the license in which Nigerian National Petroleum Corp. is the concessionaire, continued drilling into secondary, lower sections. It plans to test the main reservoirs.

Njaba-2 is OML 124's first exploration well since the mid-1980s.

Addax produces 6,000 b/d from Ossu and Izombe fields in OML 124.

Repsol YPF hits gas in Algeria's Sahara Desert

Several natural gas discoveries in Algeria's Regane and Ahnet basins could prove to be important future resources for Repsol YPF SA.

After drilling exploration well KLS-1, it tested the isolated Kahlouche Sud structure in the North Reggane concession, and gas flowed at 629,000 cu m/day at a depth of 3,720 m through a $^{32}/_{64}$-in. choke.

Meanwhile, discovery well OTLH-2, drilled in the M'Sari Akabli concession, flowed on test 249,000 cu m/day of gas at a depth of 1,280 m, and 110,000 cu m/day of gas at 1,340 m; both flowed through $^{32}/_{64}$-in. chokes, said RWE Dea AG, a consortium partner. This new independent structure was the first discovery on this block and was in its center.

The wells were drilled in Algeria's Sahara Desert and proved there is gas flow from the Lower Devonian level.

Repsol YPF said the Reggane basin is a major driver for future growth and its holdings add up to total net reserves of 145 million boe.

The consortium secured exploration rights during the 2002-03 Algerian bidding rounds. During 2005-07, three discoveries were made in Reggane: Sali-1 (SLI-1), Kahlouche-2 (KL-2), and Reggane-6 (RG-6); one exploration well in Upper Ordovician, plus two positive appraisal wells.

Repsol YPF operates the consortium with a 33.75% stake, and RWE Dea has a 22.5% interest. Other partners are Sonatrach with 25% and Edison SPA with 18.75%.

Apache finds three fields in Egypt's Western Desert

Apache Corp., Houston, reported three field discoveries in Egypt's Western Desert that tested a total of 80 MMcfd of natural gas and 5,909 b/d of oil and condensate from Jurassic formations.

"Apache plans to continue an exploration and appraisal program in 2009 to capitalize on these successes," said G. Steven Farris, Apache president and chief executive officer.

The Sultan-3x well is an oil field find in the Khalda Offset concession, 7 miles south of Apache's Imhotep field. The well encountered oil pay in the Jurassic Alam El Buieb (AEB-6) and Safa formations. It test-flowed 5,021 b/d of oil and 11 MMcfd of gas from three commingled intervals in the Safa formation.

The discovery opens up a large area for further exploration and appraisal drilling on Apache-operated acreage south and east of the well. The Egyptian minister of petroleum approved a 20-block development lease, and production is expected to commence in February. Apache has 100% contractor interest in the Khalda Offset concession.

Adam-1x and Maggie-1x discovered gas-condensate fields on the Matruh development lease north of the Sultan discovery. Adam-1x is in the center of the Matruh lease about 3½ miles south of Apache's Alexandrite field. Wireline logs indicate as much as 102 ft of gas pay in the Jurassic Safa formation. A test of an interval in the Lower Safa produced 28.5 MMcfd of dry gas.

Maggie-1x, 5 miles northeast of Adam-1x, was drilled to test closures at three levels in the AEB and Safa formations. The well logged 27 ft of pay in the Cretaceous Alam El Bueib (AEB-3D) formation and 83 ft of pay in the Jurassic Zahra and Safa formations. Preliminary results of tests of an interval in the Lower Safa formation measured gas at a rate of 40 MMcfd with associated condensate production of 884 b/d. Apache has 100% contractor interest in the Matruh development lease.

More Rajasthan discoveries commercial

India's government has approved a commerciality declaration for three 2007 gas and oil discoveries by Cairn Energy PLC in Rajasthan, northwestern India.

The declaration covers the Kameshwari West 2, 3, and 6 discoveries and an 822 sq km development area that was part of the northern appraisal area on the RJ-ON-90/1 license (see map, OGJ, Jan. 23, 2006, p. 38).

Cairn Energy noted that the No. 2 and 3 discoveries opened a new play in the Paleocene Barmer Hill-Lower Dharvi Dungar sands on the basin's western margin.

Kameshwari West-2, some 56 km south of Mangala oil field, cut 18.2 m of net pay in a 40-m gross interval of Lower Dharvi Dungar with a gas-oil contact at 1,127 m true vertical depth subsea and an oil-water contact at 1,147 m TVD ss. It flowed 33° gravity oil with gas.

Kameshwari West-3, just 10.6 km north of Kameshwari West-2, cut up to 16 m of gas pay in tight Lower Dharvi Dungar reservoir rock in a potential column of more than 100 m. TD is 1,499 m measured depth.

Kameshwari West-6, about 22 km northeast of Kameshwari West-3, tested 2.39 MMscfd of gas.

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Cairn Energy, operator with 70% interest, and its partner Oil & Natural Gas Corp. with 30% now have 3,111 sq km under long-term contract on the Rajasthan license, of which the Mangala field development plan covers 1,859 sq km and the Bhagyam field development plan covers 430 sq km.

Cairn Energy in December gauged a discovery at Raageshwari East 1/1Z, the first well in its 2008-09 exploration program.

The well cut 10 m of net oil pay in an 81-m gross column of sands in the Eocene Thumbli formation below 1,425 m. It also found 1.4 m of gas pay in the Eocene Akli formation at 1,153 m TVD ss. It stabilized at 500 b/d of 40° gravity oil and 400 Mcfd on a 1-in. choke from a 4-m interval in Upper Thumbli sand.

The companies plan to start production through a new pipeline to the Gujarat coast in late 2009. ✦

Drilling & Production — *Quick Takes*

Platform operations start up off China

Operations have begun on Production Platform B, part of Peng Lai (PL) 19-3 Blocks' Phase 2 project in China's Bohai Bay. ConocoPhillips is operator of PL 19-3, which currently is China's largest offshore oil field. Its partner, China National Offshore Oil Corp. (CNOOC), holds 51% interest in Block PL 19-3, and ConocoPhillips holds the remainder.

Platforms D and E are expected to come on line in 2009 to boost development of the oil field off China's northeastern coast.

Fluor Corp. assisted in the successful startup of the platform and provided engineering services, including conceptual engineering, front-end engineering and design, and detailed engineering. The company also provided procurement services for three wellhead platforms and construction support in fabrication yards in Shanghai, Tanggu, and Singapore. Engineering and procurement were performed from Fluor's global execution centers in Houston, Shanghai, and Manila.

The oil field development project is 235 km southeast of Tanggu and began in 1999 with conceptual and feasibility engineering. The first phase of the project involved the basic design package for the early production facility, which consisted of a fixed production platform tied to a newly modified and refurbished floating production, storage, and offloading vessel.

The project was executed in two phases. The second phase, carried out simultaneously with the first, included development of what Fluor described as the "world's largest" floating production, storage, and offloading vessel and five additional fixed production platforms tied to a central fixed riser and utility platform. Workers installed 36 miles of subsea pipeline to interconnect the facilities. Fluor designed the flow lines so early production could be routed to the existing FPSO vessel. After the new FPSO is delivered, the flow lines will be reconnected for permanent installation.

Talisman starts gas production from Rev field

Talisman Energy Norge AS has started natural gas and condensate production from Rev field in the Norwegian North Sea.

The field was expected to start production last July via a subsea 9-km tieback to the Armada platform in the UK North Sea, operated by BG International (CNS) Ltd., for processing and final export to the UK. Rev's plateau rate will be 100 MMcfd of gas and 6,000 b/d of condensate from two subsea wells. The development plan cost $444 million in 2007 money.

"A third producer, the Rev East well, is expected to be brought on stream later in 2009," Talisman said. Its share of proved and probable reserves in the field at yearend 2007 was estimated at 26 million boe, with proved reserves of 16 million boe.

Recoverable reserves are estimated at 3.9 billion cu m of gas and 600,000 cu m of condensate.

Talisman has a 70% interest in the field, with Norway's state-owned Petoro AS holding the remaining 30%.

Nexen's upgrader turns out sweet crude oil

Nexen Inc.'s Long Lake, Alta., oil sands upgrader has started production.

The upgrader is expected to reach its full design production rate of 60,000 b/d of sweet crude within 12-18 months, Nexen said. As the upgrader ramps up to full capacity, the company expects routine downtime periods as it works through early production stages. Sour crude is upgraded to light sweet crude oil and the asphaltenes are converted to a synthetic fuel gas. This gas is available as a low-cost fuel source and as a source for hydrogen required in the hydrocracker.

The gas will be burned in a cogeneration plant to produce steam for the assisted gravity drainage operations and for electricity to be used on site and sold to the electric grid. ✦

Processing — *Quick Takes*

Venezuela denies rift with Brazil over refinery

Venezuela has denied any rift with Brazil over the construction, operation, or supply of the Abreu e Lima refinery in Pernambuco state, a project 60% owned by Petroleo Brasileiro SA (Petrobras) and 40% by Petroleos de Venezuela SA.

Rafael Ramirez, Venezuela's oil minister, said there has been no conflict with Brazil regarding the refinery project despite earlier statements by Petrobras downstream director Paulo Roberto Costa (OGJ Online, Jan. 22, 2009).

Ramirez, who called Costa's comments "the opinion of a low-level official," said Venezuela has not been notified of any changes to the project.

The refinery is expected to start processing 200,000 b/d of oil, half from Venezuela and half from Brazil, by 2010, but Costa had said the two countries have disagreed on the price of the heavy Venezuelan crude that would supply the refinery.

The reports from Venezuela coincided with news Petrobras has authorized Phase 2 in the construction of the Abreu e Lima refinery, calling for construction of the facility's 150-Mw electric power plant at a cost of $408.2 million.

Meanwhile, dismissing concerns over the global financial crisis, Costa confirmed that the Abreu e Lima refinery is just one of several

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facilities that Petrobras will bring on stream in the near future.

"I'm happy every time I hear of refinery investments being postponed around the world. I want them all to be postponed. The world will continue to exist," Costa said. "It is hard to believe the world will be in a recession until 2013. It doesn't make much sense."

Costa noted Petrobras doesn't want to be an exporter of oil, but an exporter of products. "There's a world diesel shortage," he said, adding, "It is short-sighted to think there won't be market for this supply." Costa also said $2 billion should be added to Petrobras's investments in refineries, to adapt them for the production of low-sulfur diesel.

Costas named the new refineries as the 230,000 b/d Abreu e Lima facility, the 150,000 b/d Comperj facility, the 600,000 b/d Premium I facility in Maranhao, the 300,000 b/d Premium II facility in Ceara, and the 30,000 b/d unit in Rio Grande do Norte.

CSB gives more details about Utah refinery fire

The US Chemical Safety and Hazard Investigation Board provided more details about a Jan. 12 refinery fire near Salt Lake City as its investigators prepared to return to the plant on Jan. 27.

The fire in Tank 105 of the Silver Eagle refinery in Woods Cross seriously burned four workers. The atmospheric storage tank was almost full when a large vapor cloud was released and ignited at about 5:30 p.m. MST, causing a massive flash fire, CSB said on Jan. 26.

CSB said that, on the night of the incident the tank was nearly full, containing about 440,000 gal of what the refinery said was light naphtha. The federal agency said the tank has an interior floating room and has six atmospheric vents on the top sides of its exterior roof.

Investigations Supervisor Don Holmstrom said the CSB team will examine a reported history of releases from the tank and the tank seal's integrity. "We will also be looking at the operation of the refinery and any recent process changes to determine why highly volatile hydrocarbons were released on Jan. 12," he said.

Tank 105 was receiving up to three different streams of hydrocarbon liquids from the refinery, including light substances at the time of the incident, he added.

CSB said its investigators were at the refinery for 2 weeks, conducting about 30 interviews of witnesses, gathering samples and evidence, and examining the accident scene. It said the refinery's staff and management have cooperated with the investigation, and that the CSB team was coordinating with investigators from Utah's Occupational Safety and Health Administration and the South Davis Metro Fire Agency. ✦

Transportation — *Quick Takes*

Pipeline would ship Haynesville shale gas

A pipeline company and a producer launched plans to build a 178-mile, 42-in. pipeline in East Texas and Northwest Louisiana to serve the Jurassic Haynesville gas shale play.

Meanwhile, the producer, Chesapeake Energy Corp., Oklahoma City, said the Haynesville has the potential to become the largest producing field in the US.

Chesapeake said its last seven horizontal Haynesville wells averaged 16 MMcfd of gas equivalent on initial production or tests. The two most recent wells tested at more than 22 MMcfd.

The company plans to average 25 rigs in the play in 2009, up from 20 rigs currently.

Energy Transfer Partners LP (ETP), Dallas, and Chesapeake Energy Marketing Inc. plan to lay the Tiger Pipeline from Carthage, Tex., to near Delhi, La. The project will connect to ETP's dual 42-in. pipeline near Carthage and would connect to at least seven interstate pipelines at various points in Louisiana.

Capacity would be at least 1.25 bcfd initially and could be raised to 2 bcfd based on results of an open season.

Chesapeake, largest gas producer in the US, committed a firm 1 bcfd for 15 years to the project, which is to cost $1-1.2 billion and be in service by mid-2011 pending regulatory approvals.

Separately, Cubic Energy Inc., Dallas, accepted a proposal to participate with 2.8% working interest in Chesapeake's Clingman Acres-11H horizontal well in Johnson Branch field, Caddo Parish, La. It is to go to Haynesville shale at 17,000 ft measured depth.

Cubic, which is exploiting several geologic formations, has 12 wells producing in its Johnson Branch acreage, and 10 wells producing in its more southern acreage position of Bethany-Longstreet field in DeSoto Parish.

Regency cites Haynesville expansion progress

Regency Energy Partners LP, Dallas, said it has negotiated definitive agreements with shippers for 800 MMcfd or more than 70% of the capacity of its Haynesville gas pipeline expansion project in North Louisiana.

The company's existing system extends 320 miles from Waskom, Sligo, and Elm Grove fields near Shreveport to connections with interstate and intrastate pipelines near Winnsboro in Franklin Parish.

The agreements are for firm transportation capacity under 10-year contracts and are subject to conditions including final approval by Regency's board.

Regency said it is in advanced discussions with other shippers who have requested transport volumes that exceed the remaining capacity.

The company also said it has eliminated its obligation for the purchase of 28 miles of 24-in. pipe no longer needed for the revised 1.1 bcfd expansion.

The $650 million revised expansion calls for 128 miles of 36-42-in. pipe and 12,500 hp of compression.

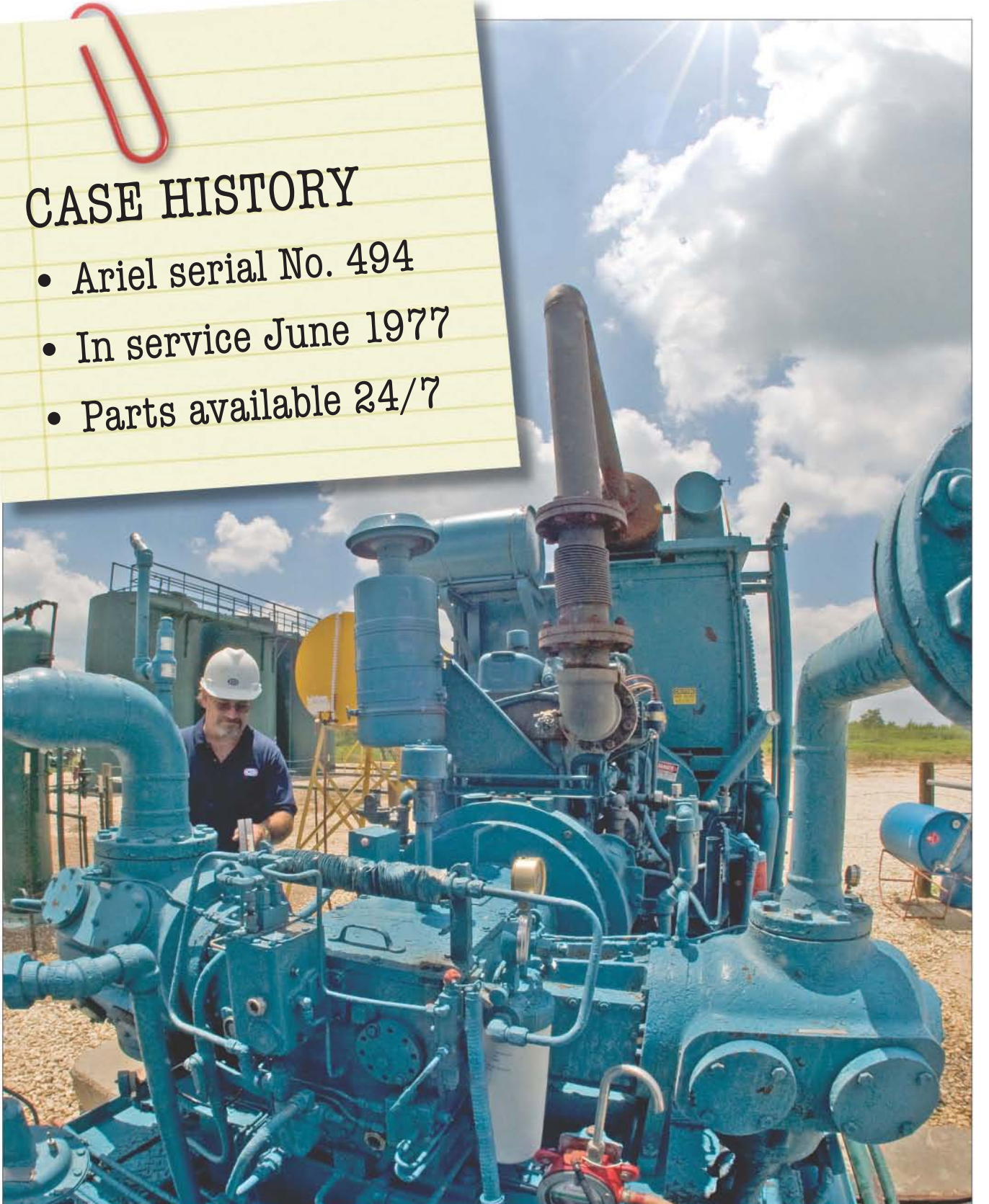
The major milestone for the project is to finalize financing arrangements. Regency is working with GE Energy Financial Services to secure funding. If financing is obtained, the expansion is to be in service by the end of 2009.

Meanwhile, Regency is acquiring rights of way and environmental permits and clearances. A construction contractor is committed to the project, and 98% of the route has been selected and surveyed.

Regency has $230 million of purchase commitments related to the expansion. ✦

CASE HISTORY

- Ariel serial No. 494
- In service June 1977
- Parts available 24/7



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Letters

After the chill

There is no doubt that while sea surface temperatures are rising and glaciers around the world are receding, as far as the global economy is concerned, we are in for a big chill. But no matter what the cause of atmospheric heating, the oil industry seems to be putting all plans for future growth in the deep freeze. But the longer they are in there, the more they will suffer from freezer burn – obsolescence.

To stop this self-destructive downward spiral oil producers and refiners ought to be thawing those frozen plans for improvements squirreled away in the freezer. Even the worst depression will ultimately bottom out, and there will inevitably be a climb upward again. The ones who begin that climb first, slow and strenuous though it be, will also be the first to benefit in whatever form the new world economy will take.

Those who look to government instead of industry to solve our present economic ills are bound to be disappointed. Democracies, well-meaning and well-directed though they may be, are hamstrung by the vagaries of free elections: Good administrations as well as bad can be voted out of office, and with them, whatever good projects have been begun. And authoritarian states will never make real progress but only batten on advances made in democratic societies.

Industry must do as much or more than government. And it is up to the petroleum industry, the only one with the proven experience in mounting long-term projects and the vision and courage to take on work of truly global scope, that can lead. It's one of the few industries that need not come begging for bailouts if indeed it still possesses the strength, self-reliance, and sheer guts of the original oil patch.

Nathaniel A. Matlin
The Matlin Co.
Langhorne, Penn.

✦ 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

FEBRUARY

SPE Reservoir Simulation Symposium, The Woodlands, Tex., (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 2-4.

IADC Health, Safety, Environment & Training Conference & Exhibition, Houston, (713) 292-1945, (713) 292-1946 (fax), e-mail: conferences@iadc.org, website: www.iadc.org. 3-4.

Deep Offshore Technology International Conference & Exhibition (DOT), New Orleans, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.dotinternational.net. 3-5.

Global Petrochemicals Conference & Annual Meeting, Cologne, +44 (0) 1242 529 090. +44 (0) 1242 529 060 (fax), e-mail: wra@theenergyexchange.co.uk, website: www.wraconferences.com. 3-5.

Russia Offshore Annual Meeting, Moscow, +44 (0) 1242 529 090, +44 (0) 1242 529 060 (fax), e-mail: wra@theenergyexchange.co.uk, website: www.theenergyexchange.co.uk. 4-6.

NAPE Expo, Houston, (817) 847-7700, (817) 847-7704 (fax), e-mail: info@napeexpo.com, website: www.napeonline.com. 5-6.

Pipeline Pigging & Integrity Management Conference, Houston, (713) 521-5929, (713) 521-9255 (fax), e-mail: clarion@clarion.org, website: www.clarion.org. 9-12.

CERAWeek, Houston, (617) 966-5992, e-mail: info@cera.com, website: www.cera.com. 9-13.

SPE Unconventional Fields Conference, Margarita Island, Venezuela, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 10-12.

Pipe Line Contractors Association Annual Conference (PLCA), Carlsbad, Calif., (214) 969-2700, e-mail: plca@plca.org, website: www.plca.org. 11-15.

IADC/SPE Managed Pressure Drilling & Underbalanced Operations Conference & Exhibition, San Antonio, (713) 292-1945, (713) 292-1946 (fax), e-mail: conferences@iadc.org, website: www.iadc.org. 12-13.

Annual Petroleum Coke Conference, San Francisco, (832) 351-7828, e-mail: petcoke.conference@jacobs.com, website: www.petcokes.com. 13-14.

International Petrochemicals Technology Conference & Exhibition, London, +44 (0) 20 7357 8394, +44 (0) 20 7357 8395 (fax), e-mail: enquiries@europetro.com, website: www.europetro.com. 16-17.

IP Week, London, +44 (0)20 8561 6030, +44 (0)20 8561-0131 (fax), e-mail: events@energyinst.org.uk, website: www.energyinst.org.uk. 16-19.

EnerCom's The Oil & Services Conference, San Francisco, (303) 296-8834, e-mail: kgrover@enercominc.com, website: www.theoilandservicesconference.com/index.html. 18-19.

International Downstream Technology & Catalyst Conference & Exhibition, London, +44 (0) 20 7357 8394, +44 (0) 20 7357 8395 (fax), e-mail: enquiries@europetro.com, website: www.europetro.com. 18-19.

ASEG/PESA International Geophysical Conference & Exhibition, Adelaide, +61 8 8352 7099, +61 8

8352 7088 (fax), e-mail: ASEG2009@sapro.com.au, website: www.sapro.com.au/aseg.htm. 22-25.

Laurance Reid Gas Conditioning Conference, Norman, Okla., (405) 325-2248, (405) 325-7164 (fax), e-mail: bettyk@ou.edu, website: www.engr.outreach.ou.edu. 22-25.

Nitrogen + Syngas International Conference and Exhibition, Rome, +44 20 7903 2167, +44 20 7903 2432 (fax), e-mail: conferences@crugroup.com, website: http://crugroup.com. 22-25.

CERI Natural Gas Conference, Calgary, (403) 282-1231, (403) 284-4181 (fax), e-mail: conference@ceri.ca, website: www.ceri.ca. 23-24.

International Pump Users Symposium, Houston, (979) 845-7417, (979) 847-9500 (fax), e-mail: inquiry@turbo-lab.tamu.edu, website: http://turbolab.tamu.edu. 23-26.

MARCH

EAGE North African/Mediterranean Petroleum and Geosciences Conference & Exhibition, Tunis, +31 88 995 5055, +31 30 6343524 (fax), e-mail: eage@eage.org, website: www.eage.org. 2-4.

SPE Research & Development Conference, Lisbon, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 3-4.

APPEX Prospect and Property Expo, London, (918) 560-2616, (918) 560-2684 (fax), e-mail: convene@aapg.org, website: www.aapg.org. 3-5.

Subsea Tieback Forum & Exhibition, San Antonio, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.subseatiebackforum.com. 3-5.

GPA Annual Convention, San Antonio, (918) 493-3872, (918) 493-3875 (fax), e-mail: pmirkin@gasprocessors.com, website: www.gasprocessors.com. 8-11.

Doha Natural Gas Conference & Exhibition, Doha, e-mail: gascon@qp.com.qa, website: www.dohagascon.com.qa. 9-12.

ARTC Annual Meeting, Kuala Lumpur, +44 1737 365100, +44 1737 365101 (fax), e-mail: events@gtforum.com, website: www.gtforum.com. 10-12.

European Fuels Conference, Paris, +44 (0) 1242 529 090. +44 (0) 1242 529 060 (fax), e-mail: wra@theenergyexchange.co.uk, website: www.wraconferences.com. 10-12.

Turkish International Oil & Gas Conference & Showcase (TUROGE), Ankara, +44 (0) 207 596 5233, +44 (0) 207 596 5106 (fax), e-mail: oilgas@ite-exhibitions.com, website: www.oilgas-events.com. 10-12.

Middle East Oil & Gas Show & Conference (MEOS), Manama, +973 17 550033, +973 17 553288 (fax), e-mail: aeminfo@batelco.com.bh, website: www.allworldexhibitions.com/oil. 15-18.

Purvin & Gertz Annual International LPG Seminar, The Woodlands, Tex., (281) 367-9797, website: www.purvingertz.com. 16-19.

Gas Asia, Kuala Lumpur, +44 (0) 1242 529 090, +44 (0) 1242 529 060 (fax), e-mail: wra@theenergyexchange.co.uk, website: www.theenergyexchange.co.uk. 17-18.

SPE/IADC Drilling Conference & Exhibition, Amsterdam, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 17-19.

Latin American Meeting on Energy Economics, Santiago, 56 2 3541411, 56 2 5521608 (fax), e-mail: info@elaee.org, website: www.elaee.org. 22-24.

NPRA Annual Meeting, San Antonio, (202) 457-0480, (202) 457-0486 (fax), e-mail: info@npra.org, website: www.npra.org. 22-24.

ACS Spring National Meeting & Exposition, Salt Lake City, (202) 872-4600, e-mail: service@acs.org, website: www.acs.org. 22-26.

NACE Corrosion Conference & Expo, Atlanta, (281) 228-6200, (281) 228-6300 (fax), website: www.nace.org/c2009. 22-26.

SPE Americas E&P Environmental and Safety Conference, San Antonio, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 23-25.

API Spring Petroleum Measurement Standards Meeting, Dallas, (202) 682-8000, (202) 682-8222 (fax), website: www.api.org. 23-26.

Asian Biofuels Roundtable, Kuala Lumpur, +44 (0) 207 067 1800, +44 207 430 0552 (fax), e-mail: a.ward@theenergyexchange.co.uk, website: www.wraconferences.com/FS1/AB1register.html. 24-25.

SPE Western Regional Meeting, San Jose, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website; www.spe.org. 24-26.

Offshore Mediterranean Conference & Exhibition (OMC), Ravenna, +39 0544 219418, +39 0544 39347 (fax), e-mail: conference@omc.it, website: www.omc2009.it. 25-27.

NPRA International Petrochemical Conference, San Antonio, (202) 457-0480, (202) 457-0486 (fax), e-mail: info@npra.org, website: www.npra.org. 29-31.

Petroleum Geology Conference, London, +44 (0)20 7434 9944, +44 (0)20 7494 0579 (fax), e-mail: georgina.worrall@geolsoc.org.uk, website: www.geolsoc.org.uk. Mar. 30-Apr. 2.

SPE/ICoTA Coiled Tubing & Well Intervention Conference & Exhibition, The Woodlands, Tex., (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. Mar. 31-Apr. 1.

Offshore Asia/Multiphase Pumping & Technologies Conference & Exhibition, Bangkok, 918) 831-9160, (918) 831-9161 (fax), e-mail: attendingOA@pennwell.com, website: www.offshoreasiaevent.com. Mar. 31-Apr. 2.

APRIL

Georgian International Oil, Gas, Energy and Infrastructure Conference & Showcase (GIOGIE), Tbilisi, +44 (0) 207 596 5233, +44 (0) 207 596 5106 (fax), e-mail: oilgas@ite-exhibitions.com, website: www.oilgas-events.com. 2-3.

SPE Production and Operations Symposium, Oklahoma City, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 4-8.

SPE Digital Energy Conference, Houston, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 7-8.

ATYRAU Regional Oil & Gas Exhibition & OilTech Kazakhstan Petroleum Technology Conference, Atyrau, +44 (0) 207 596 5233, +44 (0) 207 596 5106 (fax), e-mail: oilgas@ite-exhibitions.com, website: www.oilgas-events.com. 7-9.

Rocky Mountain Unconventional Resources Conference & Exhibition, Denver, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.RMURconference.com. 14-16.

GPA Mid-continent Annual Meeting, Oklahoma City, (918) 493-3872, (918) 493-3875 (fax), website: www.gasprocessors.com. 16.

Middle East Petroleum & Gas Conference, Dubai, 65 62220230, 65 62220121 (fax), e-mail: info@cconnection.org, website: www.cconnection.org. 19-21.

ERTC Coking & Gasification Conference, Budapest, 44 1737 365100, +44 1737 365101 (fax), e-mail: events@gtforum.com, website: www.gtforum.com. 20-22.

Hannover Messe Pipeline Technology Conference, Hannover, +49 511 89 31240, +49 511 89 32626 (fax), website: www.hannovermesse.de. 20-24.

IADC Drilling HSE Middle East Conference & Exhibition, Abu Dhabi, (713) 292-1945, (713) 292-1946 (fax), e-mail: conferences@iadc.org, website: www.iadc.org. 21-22.

API Pipeline Conference, Fort Worth, Tex., (202) 682-8000, (202) 682-8222 (fax), website: www.api.org. 21-22.

Pipeline Transport Conference & Exhibition, Moscow, +43 1 230 85 35 33, website: www.expopipeline.com. 21-23.

Base Oils and Lubricants in Russia & CIS Conference, Moscow, +44 (0) 1242 529 090, +44 (0) 1242 529 060 (fax), e-mail: wra@theenergyexchange.co.uk, website: www.wraconferences.com. 22-23.

Instrumentation Systems Automation Show & Conference, (ISA), Calgary, Alta., (403) 209-3555, (403) 245-8649 (fax), website: www.petroleumshow.com. 22-23.

CPS/SEG International Geophysical Conference & Exposition, Beijing, (918) 497-5500, (918) 497-5557 (fax), e-mail: semery@seg.org, website: www.seg.org. 24-27.

AIChE Spring National Meeting, Tampa, (203) 702-7660, (203) 775-5177 (fax), website: www.aiche.org. 26-30.

API Spring Refining and Equipment Standards Meeting, Denver, (202) 682-8000, (202) 682-8222 (fax), website: www.api.org. 27-29.

EAGE European Symposium on Improved Oil Recovery,

Paris, +31 88 995 5055, +31 30 6343524 (fax), e-mail: eage@eage.org, website: www.eage.org. 27-29.

ENTELEC Conference & Expo, Houston, (972) 929-3169, (972) 915-6040 (fax), e-mail: blaine@entelec.org, website: www.entelec.org. Apr. 29-May 1.

MAY

EAGE International Petroleum Conference & Exhibition, Shiraz, +31 88 995 5055, +31 30 6343524 (fax), e-mail: eage@eage.org, website: www.eage.org. 4-6.

Offshore Technology Conference (OTC), Houston, (972) 952-9494, (972) 952-9435 (fax), e-mail: service@otcnet.org, website: www.otcnet.org. 4-7.

GPA Permian Basin Annual Meeting, Austin, (918) 493-3872, (918) 493-3875 (fax), website: www.gasprocessors.com. 5.

Interstate Oil and Gas Compact Commission Midyear Meeting (IOGCC), Anchorage, (405) 525-3556, (405) 525-3592 (fax), e-mail: iogcc@iogcc.state.ok.us, website: www.iogcc.state.ok.us. 10-12.

ERTC Asset Maximisation Conference, Prague, 44 1737 365100, +44 1737 365101 (fax), e-mail: events@gtforum.com, website: www.gtforum.com. 11-13.

ACHEMA International Exhibition Congress, Frankfurt, +1 5 168690220, +1 5 168690325 (fax), e-mail: amorris77@optonline.net, website: http://achemaworldwide.dechema.de. 11-15.

IADC Environmental Conference & Exhibition, Stavanger, (713) 292-1945, (713) 292-1946 (fax), e-mail: conferences@iadc.org, website: www.iadc.org. 12-13.

North American Unconventional Oil & Gas Conference & Exposition, Denver, (403) 209-3555, (403) 245-8649 (fax), website: www.petroleumshow.com. 12-13.

NPRA National Safety Conference, Grapevine, Tex., (202) 457-0480, (202) 457-0486 (fax), e-mail: info@npra.org, website: www.npra.org. 12-13.

International School of Hydrocarbon Measurement, Norman, Okla., (405) 325-1217, (405) 325-1388 (fax), e-mail: lcrowley@ou.edu. Website: www.ishm.info. 12-14.

Uzbekistan International Oil & Gas Exhibition & Conference, Tashkent, +44 (0) 207 596 5233, +44 (0) 207 596 5106 (fax), e-mail: oilgas@ite-exhibitions.com, website: www.oilgas-events.com. 12-14.

NPRA Reliability & Maintenance Conference, Grapevine, Tex., (202) 457-0480, (202) 457-0486 (fax), e-mail: info@npra.org, website: www.npra.org. 19-22.

IADC Drilling Onshore Conference & Exhibition, Houston, (713) 292-1945, (713) 292-1946 (fax), e-mail: conferences@iadc.org, website: www.iadc.org. 21.

Gastech International Conference & Exhibition, Abu Dhabi, +44 (0) 1737 855000, +44 (0) 1737 855482 (fax), website: www.gastech.co.uk. 25-28.

APPEA Conference & Exhibition, Darwin, +61 7 3802 2208, e-mail: jhood@appea.com.au. website: www.appea2009.com.au. May 31-Jun. 3.

SPE Latin American and Caribbean Petroleum Engineering Conference, Cartagena, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. May 31-Jun. 3.

JUNE

Caspian International Oil & Gas/Refining & Petrochemicals Exhibition & Conference, Baku, +44 (0) 207 596 5233, +44 (0) 207 596 5106 (fax), e-mail: oilgas@ite-exhibitions.com, website: www.oilgas-events.com. 2-5.

Asia Oil & Gas Conference, Kuala Lumpur, 65 62220230, 65 62220121 (fax), e-mail: info@cconnection.org, website: www.cconnection.org. 7-9.

AAPG Annual Meeting, Denver, (918) 560-2679, (918) 560-2684 (fax), e-mail: convene@aapg.org, website: www.aapg.org. 7-10.

PIRA Scenario Planning Conference, Houston, (212) 686-6808, (212) 686-6628 (fax), e-mail: sales@pira.com, website: www.pira.com. 8.

ILTA Annual International Operating Conference & Trade Show, Houston, (202) 842-9200, (202) 326-8660 (fax), e-mail: info@ilta.org, website: www.ilta.org. 8-10.

International Oil Shale Symposium, Tallinn, Estonia, +372 71 52859, e-mail: Rikki.Hrenko@energia.ee, website: www.oilshalesymposium.com. 8-11.

SPE EUROPEC/EAGE Conference and Exhibition, Amsterdam, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 8-11.

PIRA Understanding Global Oil Markets Seminar, Houston, (212) 686-6808, (212) 686-6628 (fax), website: www.pira.com. 9-10.

GO-EXPO Gas and Oil Exposition, Calgary, Alta., (403) 209-3555, (403) 245-8649 (fax), website: www.petroleumshow.com. 9-11.

Petro.t.ex Africa Exhibition & Conference, Johannesburg, +27 21 713 3360, +27 21 713 3366 (fax), website: www.fairconsultants.com. 9-11.

Oil and Gas Asia Exhibition (OGA), Kuala Lumpur, +60 (0) 3 4041 0311, +60 (0) 3 4043 7241 (fax), e-mail: oga@oesallworld.com, website: www.allworldexhibitions.com/oil. 10-12.

ASME Turbo Expo, Orlando, (973) 882-1170, (973) 882-1717 (fax), e-mail: infocentral@asme.org, website: www.asme.org. 13-17.

Society of Petroleum Evaluation Engineers (SPEE) Annual Meeting, Santa Fe, NM, (713) 286-5930, (713) 265-8812 (fax), website: www.spee.org. 14-16.

PIRA London Energy Conference, London, (212) 686-6808, (212) 686-6628 (fax), e-mail: sales@pira.com, website: www.pira.com. 15.

IPAA Midyear Meeting, Dana Point, Calif., (202) 857-4722, (202) 857-4799 (fax), website: www.ipaa.org. 15-17.

PIRA Scenario Planning Conference, London, (212) 686-6808, (212) 686-6628 (fax), e-mail: sales@pira.com, website: www.pira.com. 16.

Atlantic Canada Petroleum Show, St. John's, Newfoundland & Labrador, 403) 209-3555, (403) 245-8649 (fax), website: www.petroleumshow.com. 16-17.

IADC World Drilling Conference & Exhibition, Dublin, (713) 292-1945, (713) 292-1946 (fax), e-mail: conferences@iadc.org, website: www.iadc.org. 17-18.

PIRA Understanding Global Oil Markets Seminar, London, 44 1493 751 316, e-mail: miles@pira.com, website: www.pira.com. 17-18.

AAPL Annual Meeting, Clearwater Beach, Fla., (817) 847-7700, (817) 847-7704 (fax). e-mail: aapl@landman.org, website: www.landman.org. 17-20.

IAEE International Conference, San Francisco, (216) 464-2785, (216) 464-2768 (fax), website: www.usaee.org. 21-24.

Society of Professional Well Log Analysts Annual Symposium (SPWLA), The Woodlands, Tex., (713) 947-8727, (713) 947-7181 (fax), website: www.spwla.org. 21-24.

SPWLA Annual Symposium, The Woodlands, Tex., (713) 947-8727, (713) 947-7181 (fax), e-mail: webmaster@spwla.org, website: www.spwla.org. 21-24.

International Offshore and Polar Engineering Conference (ISOPE), Osaka, (650) 254-1871, (650) 254-2038 (fax), e-mail: meetings@isope.org, website: www.isope.org. 21-26.

Asia LPG Seminar, Singapore, (713) 331-4000. (713) 236-8490 (fax), website: www.purvingertz.com. 22-25.

API Exploration & Production Standards Oilfield Equipment and Materials Conference, Westminister, Colo., (202) 682-8000, (202) 682-8222 (fax), website: www.api.org. 22-26.

Moscow International Oil & Gas Exhibition (MIOGE) & Russian Petroleum & Gas Congress, Moscow, +44 (0) 207 596 5233, +44 (0) 207 596 5106 (fax), e-mail: oilgas@ite-exhibitions.com, website: www.oilgas-events.com. 23-26.

JULY

Rocky Mountain Energy Epicenter Conference, Denver, (303) 228-8000, e-mail: conference@epicenter2008.org, website: www.denverconvention.com. 7-9.

API Offshore Crane Operations and Safety Conference, Houston, (202) 682-8000, (202) 682-8222 (fax), website: www.api.org. 14-15.

Oil Sands and Heavy Oil Technologies Conference & Exhibition, Calgary, Alta., (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: http://oshot09.events.pennnet.com/fl/index.cfm. 14-16.

AUGUST

SPE Asia Pacific Health, Safety, Security and Environment Conference and Exhibition, Jakarta, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 4-6.

SPE Asia Pacific Oil and Gas Conference and Exhibition, Jakarta, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 4-6.

EnerCom's The Oil & Gas Conference, Denver, (303) 296-8834, email: kgrover@enercominc.com, website: www.theoilandgasconference.com. 9-13.

ACS Fall National Meeting & Exposition, Washington, (202) 872-4600, e-mail: service@acs.org, website: www.acs.org. 16-20.

IADC Well Control Conference of the Americas & Exhibition, Denver, (713) 292-1945, (713) 292-1946 (fax), e-mail: conferences@iadc.org, website: www.iadc.org. 25-26.

Summer NAPE, Houston, (817) 847-7700, (817) 847-7704 (fax), e-mail: info@napeexpo.com, website: www.napeonline.com. 27-28.

SEPTEMBER

✦Oil & Gas Maintenance Technology North America Conference, New Orleans, (918) 831-9160, (918) 831-9161 (fax), e-mail: registration@pennwell.com, website: www.ogmtna.com. 1-3.

EAGE Near Surface European Meeting, Dublin, +31 88 995 5055, +31 30 6343524 (fax), e-mail: eage@eage.org, website: www.eage.org. 7-9.

IAEE European Conference, Vienna, (216) 464-5365, e-mail: iaee@iaee.org, website: www.iaee.org. 7-10.

Offshore Europe Conference, Aberdeen, +44 (0) 20 7299 3300, e-mail: nbradbury@spe.org, website: www.offshore-europe.co.uk. 8-11.

GITA's GIS Annual Oil & Gas Conference, Houston, (303) 337-0513, (303) 337-1001 (fax), e-mail: info@gita.org, website: www.gita.org/ogca. 14-16.

Polar Petroleum Potential 3P Conference, Moscow, (918) 584-2555, (918) 560-2665 (fax), website: www.aapg.org. 16-18.

ADC 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.

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 & Confer-

ence (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.

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.

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.

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, (972) 952-9393, (972) 952-9435 (fax), e-mail: spedal@spe.org, website: www.spe.org. 26-28.

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.

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.

IADC Annual Meeting, Miami, (713) 292-1945, (713) 292-1946 (fax), e-mail: conferences@iadc.org, website: www.iadc.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. po@omantel.net.om, website:

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

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.

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

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.

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

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

APRIL

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

What now for the oil price?

Bob Tippee
Editor

Two questions loom heavily over the oil market: Where is the bottom of the price slide? And what level will prices seek once the bounce occurs?

If the oil market were fully competitive, the price would gravitate toward the level that induced the highest-cost producer to issue an extra unit of supply. Oil entering the market then would cover a cost spectrum, with lowest-cost production always at maximum capacity.

The oil market, though, isn't fully competitive. A group of producers, members of the Organization of Petroleum Exporting Countries, deliberately limits output to keep the oil price higher than it otherwise would be.

To the extent OPEC succeeds at this, it represents a cartel. But work as a cartel is harder than it looks. Success, measured as price levitation and achieved through production restraint, generates pressure on cartel members to produce more than they have agreed to do. The tension is always great between group goals and the revenue needs of individual members.

OPEC, of course, describes its role less as a price manipulator and more as supply guarantor and market balancer. Yet its work involves the limitation of low-cost production and supplementation by higher-cost production that otherwise wouldn't be competitive. That the consequent price elevation works to OPEC's economic advantage is no mere coincidence.

Inherent instability

A market undersupplied by low-cost producers and oversupplied by high-cost counterparts is inherently instable. And its price is no longer governed by the next barrel from the highest-cost producer but by the revenue needs of the low-cost producer having the most spare capacity.

That would be Saudi Arabia.

The kingdom holds at least 70% of the idle capacity in today's shrinking market. So questions about prices in the next few months have answers in Saudi revenue targets.

In a Jan. 15 Global Oil Report dispatch, the Center for Global Energy Studies (CGES) in London used published financial data for 2008 and budget figures for 2009 to estimate Saudi requirements.

After a 2008 fiscal surplus 15 times planned levels in 2008, the Saudi budget assumes sharply lower revenue this year along with spending reductions CGES considers unlikely.

"Over the last 5 years Saudi expenditures have overshot their planned levels by 21% on average, and last year they were 24.4% higher than the budgeted amount," it says.

In 2008, the kingdom reported total income of $293 billion and expenditures of $136 billion, with $8 billion of debt retirement.

For this year, CGES projects Saudi income of $159 billion, expenditures of $169.6 billion, and debt retirement equal to last year's level. It had to estimate the split between capital and current spending in 2008 because the figures aren't published.

The 2009 income forecast assumes $112 billion from exports of oil and natural gas liquids, based on an OPEC basket price of $54/bbl, average crude production at the Saudi quota level of 8 million b/d, and liquids exports of 830,000 b/d. The forecast crude production would be down 1.23 million b/d from last year's level.

With crude and liquids output at those rates, Saudi Arabia needs an OPEC basket price of $41/bbl, after nonoil and other income, to meet its running expenses and to service national debt.

To meet those expenses and also make $40 billion in capital expenditures—$25 billion for Saudi Aramco and $15 billion for infrastructure—the kingdom needs an oil price of $59/bbl, CGES says.

Adding $8 billion in debt retirement to the assumed outlays raises the required oil price to $62/bbl.

$75/bbl target?

A comment by King Abdullah at an Organization of Arab Petroleum Exporting Countries meeting in Cairo in November, however, implied a price target of $75/bbl.

CGES considers that goal unreasonable with the global economy performing as poorly as it has recently.

"Our work suggests that despite deep cuts in output, OPEC is unlikely to coax the basket price much above $54/bbl as an average for 2009," CGES says. "As it happens, an OPEC basket price of $54/bbl with 8 million b/d of output is enough to cover Saudi Arabia's running expenses this year and leave almost $30 billion for investment, which would satisfy Saudi Aramco's annual requirement for capital and allow $5 billion for infrastructural spending."

It also would leave the high-cost producer afloat.

CGES identifies "the most expensive oil around today" as production from the Canadian oil sands, total costs of which it estimates at no more than $50/bbl. ✦

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The cost of energy anxiety

The US list of latter-day energy anxieties has a new item: labor. With Americans losing jobs faster than at any time in decades, the Obama administration proposes to make work by spending heavily on noncommercial energy. The products of this binge will be called "green jobs."

Reasons for the recent proliferation of energy worries vary: environmental alarm; the Sept. 11, 2001, terrorist attacks; the oil-price zoom that ended last July. Earlier, energy received too little attention in national politics. Now the government acts like it wants to make up for lost time.

The concerns beget hopes that beget policy proposals that need assessment more systematic than what they're receiving. Policy initiatives in an area as important as energy must be viewed in relation to and in combination with one another. They also need to be feasible and affordable. The sooner the country realizes that most current proposals having to do with energy can't pass those tests, the better.

The leading anxieties

In addition to labor, the leading energy anxieties in the US are global warming, energy security, and depletion of oil and gas resources. The concerns have given rise to policy hopes that include reduction of carbon emissions, energy independence, and accelerated development of nondepleting—renewable—energy sources.

The labor initiative proceeds from the Keynesian assumption that governments can create jobs by spending massive amounts of public money. Not all economists agree with this proposition, which nevertheless propels Washington's panicky response to the current, genuinely frightening recession.

History will judge efficacy of the Keynesian response overall. More immediately, common sense should make leaders question job creation linked to uneconomic energy. Profits create jobs; the forced use of uncompetitive energy erodes profits—or worse—for everyone except producers of the coddled energy forms. Jobs created by profligate energy spending will burden energy users and taxpayers with costs that destroy jobs elsewhere in the economy.

The attempt to mitigate global warming with carbon taxation disguised as a cap-and-trade scheme might work no better. The costly cuts envisioned for carbon dioxide emissions will have little or perhaps no effect on global average temperature. The US is on the verge of adopting them because of pressure to act urgently, even if the urgency is unfounded, and even if the cost will be stupendous.

Energy independence, for its part is more slogan than meaningful policy goal. In a world of international commerce, energy independence doesn't exist. Even a country able to produce all the energy it uses depends on internationally traded energy as long as its trading partners do. This is a fact of modern economic life to which the US, which has no hope of domestically producing all the energy it needs, must become comfortable. The potential to waste public money in futile pursuit of energy independence is great. What good is energy independence to a fiscally feeble nation?

Worry about exhaustion of nonrenewable oil and gas represents another weak peg on which to hang energy policy. Oil and gas are finite resources. Cheaply available portions of those resources are in obvious decline. But the outer limits of oil and gas available in nature are nowhere in sight. And technological advances make growing shares of those resources economic to develop.

Growth constraint

What instead should guide energy policy is the evident inability of oil deliverability to grow as fast and by as much as the world sometimes needs it to do. The constraint, by nature more financial and political than geological, should enable renewable energy to find its economic footing. That's the opportunity government should promote, not the premature displacement of petroleum.

Policies proposed in response to surging anxieties about energy receive attention mostly in isolation from one another. Assessment of cost therefore occurs proposal by proposal, increasingly in line with the mystifying notion that all government spending is somehow stimulative. In total, however, the costs of subsidies and mandates envisioned to address global warming, energy security, depletion, and now labor are incalculable. But they surely would be staggering—and exactly what a staggering economy doesn't need. ✦

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IOC challenge: providing value beyond production

Rob Jessen
Ernst & Young
Houston

In their effort to access hydrocarbons, international oil companies (IOCs) face a major challenge: convincing national oil companies (NOCs) and host governments that they provide value beyond finding and producing oil and gas.

In the 1970s, international oil companies held approximately 85% of the world's known hydrocarbon reserves. These integrated majors dominated the upstream business as they criss-crossed the globe making deals and developing oil and gas around the world. Yet just 3 decades later, the IOCs' share of reserves has plummeted to less than 10%, with industry estimates ranging from 6% to 8%.

Today, NOCs—once relegated to second-tier status behind their larger, richer, more accomplished global peers, the IOCs—control as much as 94% of the world's oil and gas reserves. As few as 10 nations—led by Saudi Arabia at 22%—account for half of total oil production; just three countries control more than half of the world's natural gas reserves.

The concentration of hydrocarbon access in the hands of an ever-smaller number of NOCs has been accompanied by a corresponding shift in the energy industry's power structure. Today, some NOCs rival the size and scope of the largest independent majors; many wield tremendous influence over current and potential partners. Some, in fact, are competing directly against IOCs for access to reserves in foreign markets.

At the same time, other market players in the global energy industry have stepped up to take on roles previously dominated by IOCs. Major oil field services firms now have the global reach and capability to provide in-depth technical and project execution skills. Private equity firms and sovereign wealth funds offer the significant capital necessary for today's large-scale production efforts. And third-party marketers provide distribution access.

Venezuela's reversal

One well-documented recent example shines a penetrating light on the new-found boldness of some NOCs. In the early 1990s—with crude oil prices below $20/bbl—Venezuela's national oil company, Petroleos de Venezuela SA (PDVSA), was losing money on the low-quality, extra-heavy crude found in vast amounts in the country's Orinoco basin. Production was expensive and time-consuming, and few refineries could process the oil once it was above ground.

With insufficient capital to invest in production equipment that could turn Orinoco heavy crude into a lighter grade suitable for most overseas refineries, the Venezuelan government reversed a 1976 decision to nationalize its oil assets and invited a number of IOCs to return to Venezuela and invest in the Orinoco basin.

To lure the IOCs, Venezuela offered low tax rates and a royalty of just 1%. The IOCs returned, investing billions of dollars in equipment, infrastructure, and technology in the process.

But less than a decade later, responding to much higher commodity prices, the Venezuelan government reversed its position, dissolved its operating service agreements with the IOCs, and forced foreign companies into joint ventures, giving the government ownership

This article was adapted from a report that appeared originally on the Ernst & Young web site at www.ey.com.

stakes that approached 80%. Faced with accepting the new terms or abandoning their investments, most investors took what was offered.

The Venezuelan government's approach underscores the dramatic change in relations between IOCs and their NOC counterparts. As commodity prices rose through mid-2008, along with the earnings of global majors, host governments became increasingly wary of existing production-sharing agreements and other contractual arrangements.

While Venezuela's unilateral action is frowned upon both publicly and privately by IOCs, other host nations are working in less dramatic but equally productive ways to gain benefits from majors eager to do business—often asking for deeper relationships that go beyond simple resource development to include technology transfers, skills training, infrastructure support, economic development, and more.

It is in this more competitive, more demanding environment that IOCs find themselves seeking ways to maintain long-term relationships with NOCs and host governments that are productive, profitable, and equitable to all parties.

An integrated approach for IOC work with NOCs

Access to markets.	Refining and marketing joint ventures can make it easier for NOCs to monetize their resources.
Technology transfers.	Areas such as gas-to-liquids, heavy oil extraction, biofuels, and research collaboration—where major IOCs have extensive experience and significant research and development investments—are of growing interest to many NOCs.
Investments in downstream infrastructure.	Development of refining and petrochemicals facilities provides value chain integration benefits and can create new capacity closer to centers of emerging demand.
Technical services.	In-depth training and education can enhance an NOC's human capital, create jobs, and improve the NOC's competitiveness.
Social and infrastructure benefits.	IOCs with embedded, strategic corporate social responsibility initiatives can provide tremendous value to host countries eager to create economic development in local communities.

The value proposition

IOCs remain critical to helping resource-rich nations unlock the full potential of their oil and gas reserves. The ever-growing scale and complexity of future oil and gas development projects guarantee that IOCs will continue to play a vital role in meeting the world's energy needs.

The ongoing growth in energy demand has some industry experts predicting that worldwide capital spending on new projects could reach $400 billion during 2008-15. Much of that spending is slated for so-called "mega-projects," with individual costs greater than $5 billion each.

These types of complex, high-dollar, high-risk projects will continue to provide opportunities for IOCs that can effectively integrate their offerings and provide a single-resource partner for NOCs, one that can leverage existing capabilities to create value beyond production.

Indeed, while NOCs have built technical expertise and improved access to capital in recent years, they still rely on IOC partners, which bring a full complement of skills, knowledge, and technology to their partnerships, especially for large-scale, high-cost, complex projects.

The key differentiator for IOCs today is their ability to integrate these multifaceted offerings to meet the unique needs of NOCs. IOCs that adopt a "custom package" approach of value-added skills and technology will find themselves with advantages not shared by vertical-market competitors such as individual financiers, oil field service firms, project management companies, and product marketing firms.

For example, the world's major IOCs have unparalleled expertise in maximizing the value of reserves over the full life cycle of the field. From project planning and execution to operations management and the ability to deploy new technologies that extend production long past original projections, this type of integrated approach—melding technology, skill, and hands-on experience—ultimately results in more energy and much higher financial returns for host nations.

Contrasted with the higher complexity of working with a number of individual vertical market firms—along with the possibility that total production from a project may not be as high as expected due to the lack of integrated technology and expertise—the IOC value proposition becomes clear.

An example of an integrated approach could be a partnership of an IOC and an NOC to develop natural gas resources in which the companies don't stop at a production-sharing agreement but instead also agree to jointly develop LNG processing and delivery facilities and infrastructure, petrochemical manufacturing, and a high-tech training center to develop local skills.

New mindset

It is clear that IOCs must have a change in mindset toward their rela-

tionships with NOCs. The traditional relationship between IOC and NOC was, in many ways, a simple partnership of convenience. The NOC needed help in developing reserves; the IOC wanted access.

Today, however, there is a wide range of economic, political, and social implications inherent in every IOC-NOC discussion. Host governments are no longer satisfied with purely commercial agreements, even those with very favorable terms. They view the natural resources of their countries as a tool for financing social reform, boosting economic development, improving infrastructure, and creating jobs, along with a host of other individualized needs.

Thus, the IOC that sharpens its ability to listen carefully and respond to each government's unique vision for its resources and country as a whole will be the one that gains a global reputation as a "partner of choice." Understanding local customs and history and recognizing the host nation's desire for its future can be invaluable in crafting contractual agreements that meet the country's expectations for its partnerships.

At the same time, IOCs that prove their ability to develop local work forces—through education and training; the support and use of local vendors and contractors; and infrastructure development that underpins employment, such as building schools and roads—will no doubt receive strong attention from NOCs seeking long-term partners.

The work force

IOCs also must not let their own work-force development efforts lag. In order to maintain their competitive advantage over "single-role" players, it is imperative that IOCs strengthen their scientific, engineering, and project management skills by hiring and training a new generation of employees. The looming talent gap in the energy industry has been well documented, and it is here that IOCs are most vulnerable to competition.

The ability to plan and execute large-scale, complex development projects has long been a key differentiator for IOCs, yet the world of top-quality project managers with this level of skill is small, and there is plenty of demand for the services of these professionals. At the same time, many of these highly skilled employees are in their 50s or beyond with retirement looming. The IOCs that invest in developing the "next-gen" talent pool will be leaders in future partnership efforts.

The importance of human capital cannot be overstated for energy firms seeking a competitive advantage in the coming years. Recruiting, training, and retaining skilled technical employees should be a major area of focus for every energy organization, and it should receive the full attention of senior management. Outside expertise in planning and implementing enterprise-wide human capital programs—integrating all facets of human resources, including compensation, skill development and training, and succession planning—can be a valuable asset to major energy companies seeking to implement long-term cultural changes that will attract and retain employees.

Workers that are well versed in subjects such as local tax laws, deal structuring, financial requirements, customs, and the political and business climate can be extremely valuable to energy companies doing business around the globe. These types of advisory skills complement companies' in-house knowledge and strengthen their ability to construct agreements that benefit all parties.

Listening and responding

To be successful in today's environment, IOCs must demonstrate and communicate that they seek long-term partnerships with NOCs and possess an organizational culture that is focused on listening and responding to the full range of host governments' social and economic needs.

IOCs must realize that investing in and developing local work forces and supporting economies are necessary parts of doing business around the world and that their ability to do so is another competitive advantage over smaller, single-service competitors.

In addition, IOCs must learn to package the elements of their core value proposition—technology, financial resources, access to markets, project execution expertise, and vertically integrated offerings—in innovative ways that are customized to each market. Adaptability is the watchword for future contractual negotiations; the willingness to seek out balanced, "win-win" agreements is key.

Meanwhile, IOCs must recognize and respond to the looming talent shortage in the energy industry by designing enterprise-wide human capital programs that strengthen their ability to attract, train, and retain key employees who bring the skills and expertise that NOCs need. And they must continue to work to develop their in-country relationships with experts in tax, financing, and other local financial and business regulatory issues in order to negotiate from positions of knowledge and understanding.

The global power shift is real, and it has serious implications for the future business prospects of IOCs. But those that are willing to adapt to the shift—and who do so quickly and successfully—will maintain their competitiveness and viability in the decades to come. ✦

The author

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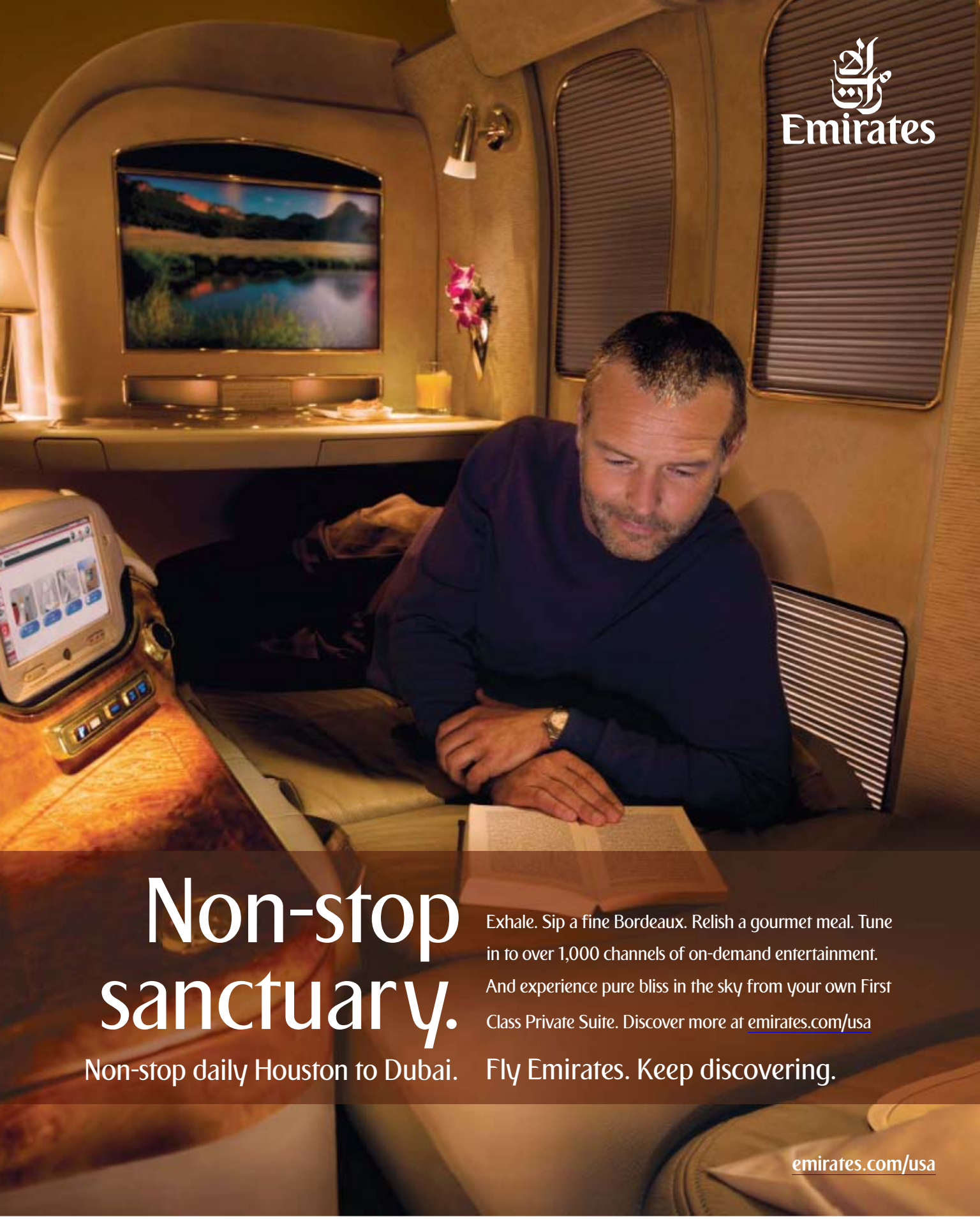

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Clinton: Energy security a major US foreign policy element

Nick Snow
Washington Editor

Energy security must be an important and integrated element of US foreign policy, US Secretary of State Hillary R. Clinton said as the Senate considered her nomination.

Noting that President Barack H. Obama identified energy as one of his top national security priorities during his presidential campaign, Clinton said she has considered energy security and climate change among the most pressing challenges facing the US and the world.

"These are issues on which I will personally engage, and they will consistently receive high-level attention at the [State] Department. I will work with our friends and partners around the world, who are facing the same challenges. I also intend to ensure that the department works vigorously through the interagency process on these issues," she said in a written response to questions Sen. Richard D. Lugar (R-Ind.) submitted to her following her Jan. 13 confirmation hearing before the Senate Foreign Relations Committee.

In opening remarks at that hearing, Lugar, the committee's ranking minority member, said that Russia's cutting off natural gas supplies was only the most recent example of how energy supply vulnerability constrains US foreign policy options.

Lugar said he looked forward to supporting Obama's efforts to reduce US dependence on foreign oil. "Yet domestic reform alone will not be sufficient to meet the global threats to our national security, economic health, and climate. In my judgment, energy security must be at the top of our agenda with nearly every country. Progress will require personal engagement by the secretary of state," Lugar maintained.

'Not just a cartel'

Lugar said in a speech he delivered at a 2006 North Atlantic Treaty Organization summit in Riga, Latvia, that a country's halting gas exports in midwinter violated Article 5 of the NATO agreements as surely as tanks and aircraft crossing a country's border. Clinton agreed, adding: "I think we have learned the hard way that the [Organization of Petroleum Exporting Countries] cartel is not just a cartel, but a security geopolitical strategic effort." Russia is trying to create a gas equivalent of OPEC, which would give it a much greater multilateral international reach on gas in addition to the bilateral powers it currently has, she said.

"Specifically with respect to Russia and its interactions with Ukraine, Georgia, and other European countries, and its recent purchase of the Serbian gas utility, I hope we can make progress with our friends in NATO and the [European Union] to understand that we do need a broader framework in which we can talk about energy security issues. It may or may not be Article 5, but I think it certainly is a significant energy challenge that we ignore at our peril," Clinton said.

Sen. George V. Voinovich (R-Ohio) also expressed concern over impacts on European countries' decision-making of potential Russian gas cutoffs. "It seems to me that we ought to really raise the issue of energy independence in terms of our national security, and also be able to make the right decisions in the world when some of our allies may not be able to because they're frightened that somebody is going to shut off their gas," he said.

Clinton responded that this was one reason why Obama has talked about an energy partnership with Latin America, "looking to find ways through technology and other activities we can work together to become more energy independent in this hemisphere." She said that includes meeting challenges posed by presidents of some energy exporting nations such as Venezuela's Hugo Chavez and Bolivian's Juan Evo Morales, as well as concerns expressed by other countries over their energy supplies.

"As you and Sen. Lugar have pointed out, that becomes even more acute in Europe. So I think this deserves a lot of attention," she told Voinovich. She said she intends to follow a recommendation Lugar originally proposed in 2006 that was signed into law as a provision of the 2007 Energy Independence and Security Act to appoint an international energy affairs coordinator within the department. (Lugar noted, in his written questions, that Clinton's predecessor, Condoleezza Rice, placed the position within the undersecretary for economic, energy and business affairs' office. "Thus, the highest ranking State Department official devoted to energy issues remains at the level of office director," the senator said.)

Hillary R. Clinton was sworn in as US Secretary of State on Jan. 21 in her US Senate office by Kathleen Oberly, an associate judge in the District of Columbia Court of Appeals, as former President Bill Clinton holds the bible. Photo from Department of State.

Caspian pipelines

Lugar also said in his written questions that on Mar. 21, 2008, then-US President George W. Bush appointed a presidential envoy for Eurasian Energy amid new opportunities for US engagement in Central Asia as Russian authorities made a strong effort to exert further control over Caspian region energy supplies. He then asked Clinton what level of US engagement she felt would be helpful to opening trans-Caspian energy trade and investment.

"Vigorous US engagement to promote opening of trans-Caspian energy trade is an important priority for US interests. Russia's cutoff of gas shipments to Ukraine (and by extension to much of the rest of Europe) in early 2009 (following a similar move in 2006) served as a sharp reminder of how dependent Europe is on energy imports from Russia. That energy dependence can create a degree of political dependence that we should seek to help the Europeans avoid," she responded.

"Vigorous US engagement to promote opening of trans-Caspian energy trade is an important priority for US interests. Russia's cutoff of gas shipments to Ukraine…in early 2009…served as a sharp reminder of how dependent Europe is on energy imports from Russia." ***—US Sec. of State Hillary R. Clinton***

Noting that the administration of her husband, President Bill Clinton, helped promote the Baku-Ceyhan-Tbilisi pipeline in the 1990s, Hillary Clinton said the US currently "should be heavily engaged in helping to promote stable and transparent energy trade in Europe, including between Russia and Ukraine, and energy diversification for Europe, a goal that requires more energy trade with producers in the Caspian region." The Eurasian energy issue is complex and requires high-level US attention and engagement, she said, and she intends to consult with the president "and with our energy and national security teams to determine the best way to devote that attention."

The proposed Nabucco gas pipeline could be a critical element in efforts to diversify European energy supplies, she observed. "Completing such an expensive, complicated, multinational project, however, will require painstaking alignment between commercial and governmental actors. An essential element of such a project will be the commercial fundamentals. A successful strategy to promote Nabucco or other pipelines along the southern corridor to European markets will require consistent, high-level engagement, including by the United States," Clinton said.

Turkey will be a critical partner in such efforts, and Clinton said she would seek to restore and develop the longstanding US strategic relationship with that country "which has come under strain in recent years." She said, "Supporting Turkey's effort to develop and implement sound and sustainable energy policies is in the interest of Turkey, all of Europe and the United States because it will help Turkey be a reliable partner and transit country for gas flowing to other European markets."

China initiatives

Clinton also said US economic and foreign policies toward China should be closely coordinated, and that the US will press the Chinese government to live up to its commitments in trade agreements and to meet its international responsibilities. Because the Obama administration considers energy security and climate change one of the most pressing challenges facing the US and the world, she said Obama would ask countries that emit the most carbon to join a new Global Energy Forum to lay the foundation for new climate protocols.

"We need to work with China on agreeing to a global carbon cap. We also need to work closely with China and other countries on the development of low-carbon energy technologies to reduce our shared reliance on carbon-intensive technology," she said in response to Lugar's written questions.

During the hearing, Clinton noted in a response to Voinovich that Senate Foreign Relations Committee Chairman John F. Kerry (D-Mass.) has a longstanding interest in effective global climate change agreements, and understands that China, India, Russia, and other major nations need to be part of the process leading up to the next major discussions in Copenhagen. "I think, as I say, this can be both included but also independently given attention to by emphasizing energy security, which I intend to do," she said.

In one of her written responses to Lugar, she said the International Energy Agency should be laying the groundwork now for eventual Chinese and Indian membership to increase energy policy coordination with countries where energy consumption is growing rapidly, to maximize the opportunity for agreeing on energy standards and principles such as transparent energy markets, to ensure the coordinated release of strategic petroleum reserves during a major market disruption, and to maintain IEA's position as the voice of the world's major energy consuming nations.

"The center of energy demand growth is shifting away from the [Organization for Economic Cooperation and Development] countries to many of the world's developing countries. The IEA was created as an institution that represents the interest of the major energy consuming nations. If its membership does not change to reflect who those nations are today, its authority and effectiveness will erode," Clinton said.

Growing market weight

"The great majority of increased global energy demand in coming years will come from emerging economies, in particular China and India. Both are

also building strategic petroleum reserves. Given their growing weight in international energy markets, it is in our interest to include them as members of the [IEA] and to coordinate closely with them on usage of strategic petroleum reserves in case of an oil supply emergency. Global energy security will benefit from the integration of their potentially large strategic reserves into the IEA system," she continued.

Full membership for China and India in the IEA probably would require modifying the original 1974 International Energy Program treaty agreement which created IEA, but the range of options for potentially integrating the two countries into the organization has not been fully explored, according to Clinton.

"The IEA makes decisions by consensus among the member states, and consensus can and will be reached on how to prepare the IEA for eventual Chinese and Indian membership, even as China and India must also commit themselves to and prepare for IEA membership. The State Department will support these efforts, up to and including revision of the International Energy Program," she said.

She also said the US should do all that it can to promote adoption of clean energy technology and best practices as developing countries address energy challenges. "The full suite of energy sources (oil, gas, coal, nuclear, and all renewables, in tandem with conservation and efficiency improvements) will be necessary to meet projected global and domestic energy demand over the next 25 years," she said.

"US foreign assistance that promotes energy access in the developing world should focus on clean energy technology, which includes renewable energy [and] energy efficiency as well as clean coal technology. The United States leads in research, development, and deployment of renewable energy," Clinton observed.

"The full suite of energy sources—oil, gas, coal, nuclear, and all renewables, in tandem with conservation and efficiency improvements—will be necessary to meet projected global and domestic energy demand over the next 25 years." **—US Sec. of State Hillary R. Clinton**

Bigger expenditures

She said that "a very substantial increase in US assistance" would be needed if the US set a priority of eliminating "energy poverty" with a focus on reliable, affordable, and clean energy.

"Most of the required investment, however, must come from the private sector. In order to mobilize that investment, major policy and regulatory reforms are needed in many countries. Neither public nor private utilities and their investors can generate the capital required to expand access to clean, sustainable energy supplies, for example, when regulatory regimes prevent them from recovering their direct and indirect operating costs," Clinton said.

"Developing countries must bear primary responsibility for moving the reform process forward. When they do, US assistance can support them in two major ways. First, our technical assistance can help to establish the overall regulatory and policy environment to stimulate new public and private investments. And second, our project-based financial guarantees can help to reduce the perceived risks and costs of mobilizing the much larger flows of private sector financing [which would be] required," she maintained. ✦

California, other states granted right to set their own air quality standards

Nick Snow
Washington Editor

US President Barack H. Obama signed memorandums on Jan. 26 granting California and other states the right to raise air quality standards above the national level and ordering the Department of Transportation to establish higher fuel efficiency requirements for automakers in the 2011 model year.

The states had asked for authority to adopt more-stringent antipollution regulations previously but were rebuffed by the Bush administration, Obama noted. "Instead of serving as a partner, Washington stood in their way. The days of Washington dragging its heels are over," he said.

The president called the memorandums "a down payment on a broader and sustained effort to reduce our dependence on crude oil." Two California Democrats who chair congressional committees related to energy and the environment immediately applauded the action.

Senate Environment and Public Works Committee Chairman Barbara Boxer called it "more than welcome news." She said the states seeking the federal regulatory waiver represent more than half the total US population, and that she would work closely with Lisa P. Jackson, the new Environmental Protection Agency administrator, to make certain the California waiver moves forward quickly.

"This is a tremendous and long overdue step for energy independence and the environment. President Obama is taking the nation in a decisive new direction that will receive broad support across the country," noted Henry A. Waxman, chairman of the House Energy and Commerce Committee.

Regulatory patchwork

In California on Jan. 26, Gov. Arnold Schwarzenegger said he also hoped

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Blue jobs, green jobs

Several congressional leaders are aggressively promoting "green jobs" as US President Barack H. Obama develops his New Energy for America plan. A leading oil and gas trade association executive thinks they should encourage what he calls "blue jobs" as well.

"Roughly 5.8 million Americans are employed in and supported by the natural gas and oil industries. We call these 'blue jobs,' taking that image from the blue flame that comes from clean-burning natural gas," said Natural Gas Supply Association Pres. R. Skip Horvath.

"We fully support the creation of more 'green jobs,' but we'll be wearing our 'blue jobs' buttons when we meet with political leaders in Washington this year. We want them to better understand how vital our industry is," Horvath said Jan. 14 during a US Energy Association briefing.

"Solar and wind are the green energy forms everyone knows, but it takes blue to make green work. Fly-wheels, chemical batteries, compressed air, and elevated water are future technologies that may someday be able to help solar and wind store energy, but the technology that's available now to back up these generation sources is natural gas," Horvath said.

160,000 more jobs

During fourth-quarter 2008, as the US economy contracted, oil and gas extraction firms added 16,000 jobs compared to the comparable 2007 period, Horvath said. He also cited figures from a study by ICF International for the American Petroleum Institute that indicated on Dec. 8 that opening domestic supply areas could create 160,000 jobs.

For every person directly employed in the oil and gas industry, another two work for companies that support the business, Horvath observed. "We are talking about approximately 6 million people employed directly or indirectly by natural gas and oil firms," he said.

Gas also is a key US manufacturing component, Horvath said. "One third of America's natural gas is used to create everything from trash bags and pantyhose to antifreeze and detergent," he said.

When gas is green

The American Gas Association, meanwhile, applauded US Sen. Ben Nelson (D-Neb.) on Jan. 23 for his bill to provide a tax incentive to turn noxious waste into usable gas by increasing gas production from animal waste, landfills, and renewable biomass.

"The natural gas from this process is a 'green' fuel. By taking a waste product and converting it to a valuable fuel, we create a source of domestic supply that benefits the consumers of natural gas. AGA believes this fiscally responsible proposal should be included in the stimulus package that is being considered in Congress," AGA Pres. David N. Parker said.

Finally, in its comprehensive energy strategy, the Obama administration included prioritized construction of a gas pipeline from Alaska as part of a program to create 5 million green jobs in the next 10 years. ✦

federal regulators would move quickly on the matter. "With this announcement from President Obama less than a week into his administration, it is clear that California and the environment now have a strong ally in the White House. Allowing California and other states to aggressively reduce their own harmful tailpipe emissions would be a historic win for clean air and for millions of Americans who want more fuel-efficient, environmentally friendly cars," he said.

The American Petroleum Institute immediately criticized Obama's action on the states' request for a federal regulatory waiver. "Creating a patchwork regulatory structure across multiple states would most likely impose higher costs on consumers, slow economic growth, and kill US jobs," it said in a Jan. 26 statement.

"The oil and natural gas industry already is doing its part: Since 2000, it has invested $42 billion into zero and low-carbon research and development. That's 45% of all such spending by US companies and the federal government combined," API continued.

Environmental organizations applauded Obama's move. "For too long, Washington has taken a back seat to California, 13 other states, and the District of Columbia that have long understood the solution to global warming and job creation are one and the same. This action will help the entire country benefit from their foresight," said Steven Biel, global warming campaign director at Greenpeace.

"Giving states the power to regulate tailpipe emissions and moving forward on a national increase in fuel efficiency are the bold and necessary moves we expected from President Obama, who campaigned on the issue of fuel efficiency and global warming. These moves, coupled with investments to double renewable energy generation, improve our power grid and increase home energy efficiency, will create jobs and lessen our dependence on fossil fuels," said Gene Kapinski, president of

the League of Conservation Voters.

Other groups' reactions were mixed. "President Obama has done more in one week to reduce oil dependence and fight global warming than President [George W.] Bush did in 8 years," said Daniel J. Weiss, a senior fellow and climate strategy director at the Center for American Progress. "His actions today respond to scientists' urgent warnings to reduce global warming pollution now before it's too late. These fuel economy measures come on top of $90 billion of clean energy investments in his economic recovery package," Weiss added.

Thomas J. Pyle, president of the Institute for Energy Research, said the California Air Resources Board has estimated that its proposed automobile emissions standards would add at least $1,050 to the cost of each car. "Few states depend more on others for energy than California. Few states ask their citizens to pay more for their electricity. Today's announcement ensures that working-class Californians also will have a harder time affording cars in the future," he said. ✦

Pemex reports 9.2% decline in oil production for 2008

Eric Watkins
Oil Diplomacy Editor

Mexico's Petroleos Mexicanos (Pemex), eyeing continued depletion at its main oil field, said the country's oil production declined by 9.2% in 2008 to just under 2.8 million b/d.

The country's level of production was the lowest since 1995, when it reached 2.62 million b/d, according to statistics from the energy ministry.

Pemex explained the decrease as due largely to continuing depletion of the country's Cantarell oil field and to Hurricane Ike, which disrupted production in the Gulf of Mexico.

Pemex said the gradual depletion of Cantarell, where production dropped by 461,000 b/d to around 1 million b/d in 2008, was partly offset by increased output at Ku-Maloob-Zaap field, which saw production averaging 702,000 b/d in 2008.

Altogether, Mexico's oil production rose in December to 2.717 million b/d from 2.711 million b/d in November, but it declined sharply from December 2007, when Pemex produced 2.954 million b/d.

Underlining a positive note, however, Pemex said that KMZ field reached a record production level of 802,000 b/d on Dec. 29, making it "foreseeable that in 2009 this field will become the primary oil producer in the country."

Optimism expressed

The Pemex statement echoed optimism expressed last month by Energy Minister Georgina Kessel who told the Mexican Senate that, with recent energy sector reforms, Pemex would produce 2.7-2.8 million b/d in the 2009-10 period—volumes near its current output.

"Beginning in 2011, a gradual increase in production will begin until we reach levels near or slightly superior to 3 million b/d in 2015," the minister said.

Meanwhile, Mexico exported 1.4 million b/d of oil in 2008, down 16.8% from 2007, but Pemex still earned a record $43.32 billion from foreign oil sales due to soaring global petroleum prices. Of total exports, 87.2% went to the US, 10.3% to Europe, and the remainder to Asia.

The median price for Mexico's blend of crudes in 2008 was $84.35/bbl, about 37% higher than in 2007.

However, the country's gasoline imports for 2008 averaged 336,200 b/d, up 9.1% over 2007, a rise that is expected to continue as domestic demand outstrips production from the country's refineries.

Pemex has announced plans to build a new 300,000 b/d refinery, but it has delayed the onset of construction until yearend, and the facility is unlikely to be online before 2015 (OGJ Online, Jan. 20, 2009). ✦

Newly formed NCOC takes over Kashagan field operatorship

Eric Watkins
Oil Diplomacy Editor

The newly formed North Caspian Operating Co. BV (NCOC), as part of earlier agreement, has replaced the Agip KCO consortium as operator of Kazakhstan's Kashagan oil field development project, also known as the North Caspian Sea production-sharing agreement, or NCS PSA.

The Eni SPA-led Agip KCO consortium, which earlier confirmed that the project will reach a maximum output of 1.5 million b/d by the end of the next decade, agreed in October 2008 to hand over operating control of Kashagan to NCOC this month.

NCOC, which is incorporated in the Netherlands, is comprised of all the partners in the NCS PSA consortium, including KazMunayGaz, Eni SPA, Total SA, ExxonMobil Corp., and Royal Dutch Shell PLC, each holding 16.81%; ConocoPhillips 8.40%; and Inpex 7.55%.

Eric Watkins, Oil Diplomacy Editor

Contention in Madagascar

Madagascar's oil and gas industry received a blow last week when thousands of demonstrators, demanding a new government, hit the streets and set fire to an oil depot.

The trouble erupted when the government closed a radio station belonging to the opposition party whose leader, Andry Rajoelina, said two protesters were killed in the affray.

President Marc Ravalomanana had earlier accused Rajoelina of promoting the government's overthrow and declared that the government would act decisively to "restore order" on the Indian Ocean island off southeastern Africa. The opposition radio station soon went off the air.

The altercation came just weeks after Sino Union Petroleum & Chemical International Ltd. told shareholders that it expects to see oil production "very soon" from its primary onshore oil and gas block in Madagascar.

Sunpec's success

In addition to the eight wells it already has drilled on the island, Sunpec said it planned to drill three more on Madagascar's Block 3113 during this year's first quarter. That's not a surprising decision since all eight of Sunpec's earlier wells showed oil and gas.

Sunpec is hardly the only company to have an interest in Madagascar. Indeed, in December last year, Houston-based Madagascar Oil boosted its estimate of reserves at its Tsimiroro project on the Indian Ocean island by 30% to 1.7 billion bbl. In March, the company said it produced Madagascar's first oil in 60 years from an onshore steam injection pilot project at Tsimiroro, one of two heavy oil projects the firm is developing.

"The company was able to explore 16 of the 27 new structures identified by an independent evaluation and had a 75% exploration success rate," said Madagascar Oil's chief executive officer, Alex Archila.

The company said 12 of 17 exploration wells drilled on the Tsimiroro Block yielded discoveries indicating 900 million-1.4 billion bbl of oil in place.

Estimates confirmed

It said another six appraisal wells confirmed its previous estimate of about 300 million bbl elsewhere on the block. Tsimiroro's oil gravity is about 14° API, it said, and it responded well to being heated by steam injection.

The private firm says its other project at Bemolanga, also in northwest Madagascar, is one of the biggest undeveloped bitumen reserves in the world, with an estimated 9.8 billion bbl of oil reserves.

In September, French oil giant Total signed an agreement with Madagascar Oil to operate the Bemolanga license with a 60% interest. Reports surfaced a month later that Total also would be interested in taking a share of Sunpec's Block 3113.

It was a rumor that Sunpec hotly denied, saying Total had no involvement in the project at the moment and that Sunpec had "no intention" of cooperating with Total on the development of Block 3113 in the future. There's probably more to those riots than the shutdown of a radio station. ✦

New operating model

Under terms of the new operating model, which became effective on Jan. 22, NCOC will oversee all of the project's activities. It will manage planning, coordination, reservoir modeling, conceptual studies, appraisal plans, early development plans, and government interfaces.

NCOC will be staffed by representatives of all partner companies and, according to reports, will be run largely in line with the Total SA management system.

The managing director of the new joint operating company will be on rotation among the partners, and the position initially will be held by a Total SA executive, while the deputy managing directorship will be held by an executive of KazMunayGaz.

Although NCOC will oversee the project, under terms of the agreement struck by the consortium partners and the Kazakh government last October, some of the partners will still have direct responsibilities for the project's execution.

Two-phase development

Phase 1 of the project, which is due online in late 2012, will be under the responsibility of Eni SPA. Under Phase 1, oil production is expected to reach 300,000 b/d, increasing to 450,000 b/d during Phase 2.

Shell will manage the production operations after the start-up of Phase 1, with KazMunayGaz assuming greater responsibility over time.

Meanwhile, Phase 2 will fall under the responsibility of three partners: Shell for offshore development, Eni for the onshore plant, and ExxonMobil for the drilling.

To carry out their responsibilities, Eni, Shell, and ExxonMobil will have appropriate authority on matters such as staffing, procurement, and operating procedures, and they will apply their own companies' management systems.

Meanwhile, in mid-January, Aker Solutions announced that, in a joint venture with CB&I and WorleyParsons,

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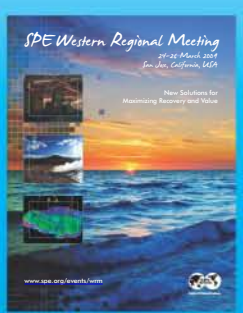

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it received a front-end engineering and design (FEED) services contract valued at $135 million for Phase 2 of the full-field development of Kashagan field.

The scope of work for Phase 2 includes the FEED for both onshore and offshore facilities and pipelines.

Aker said the FEED contract also includes options for early works, detailed engineering, procurement services, technical assistance, and design-system integrity.

Work on the project, initiated after tendered under a letter of intent issued by Agip KCO, began on Nov. 3, 2008, and it is expected to complete in first-quarter 2010.

Shareholders in the joint venture company (K-WAC Ltd.) include Worley-Parsons Europe Ltd. 45%, CB&I UK Ltd. 25%, and Aker Engineering & Technology AS 30%.

Aker Solutions and WorleyParsons also are engaged in the execution of Phase 1 of the Kashagan project, performing detailed design, fabrication, and hookup. ✦

Libya threatens to nationalize its oil industry

Uchenna Izundu
International Editor

Libya may nationalize its oil industry to control production as oil prices have plummeted over 70% over the past year, said Muammar Qadhafi, the country's leader.

Speaking during a televised address at Georgetown University in Washington, Qadhafi said, "Oil exporting countries may look to nationalization because of the rapidly declining prices." He added that, at the current low prices, "we may refuse to sell it (oil)." Oil prices need to increase to $100/bbl to halt talks of nationalization, Qadhafi said.

According to state-run media, there is increasing pressure on the nation's legislative and executive bodies to vote for nationalization of oil companies.

Qadhafi even suggested that Libya may reject OPEC's quotas by withholding production from the global markets to help boost prices. "We would not adhere to OPEC's regulations because our livelihood depends on oil." However, he gave no details on implementation.

Thought not likely

Some analysts said, however, that it is highly unlikely that Qadhafi would follow through on these threats as it is seeking foreign investment to improve its oil and gas industry. Libya recently renegotiated several exploration contracts with foreign companies.

Current operators such as Repsol YPF SA, Eni SPA, and Petro-Canada have said they have received no notification that Libya would nationalize its oil industry and were skeptical about the idea.

"Given Libya's dire need of technology and investment—as well as the damage to its international relations a nationalization would inflict—he is most likely pressurising remaining IOCs to agree to tighter terms and trying to influence the oil markets," said consultant IHS Global Insight.

Its comments were mirrored by Citigroup, which said: "We see nationalization by Libya as extremely unlikely." The bank added that "the statements are more likely to be a precursor to upcoming contract negotiations with oil majors, designed to strengthen the government's hand."

By drawing attention to the global economic meltdown and its effect on oil demand and prices, Qadhafi has highlighted the government's vulnerability as it would cofinance multibillion-dollar projects that were predicated on higher prices last year.

Operators are delaying or cancelling oil and gas projects due to price slumps and economic uncertainty, which, in the long term, is likely to exacerbate oil prices, analysts have warned. ✦

Indonesia rejects ExxonMobil's claim to Natuna D-Alpha

Eric Watkins
Oil Diplomacy Editor

Indonesia has rejected a plan of development for the Natuna D-Alpha block filed last week by ExxonMobil Corp., saying the firm's contract expired in 2005.

"Upstream oil and gas regulator BP-Migas has sent an official letter rejecting ExxonMobil's [plan of development] on Jan. 14," said Energy and Mineral Resources Minister Purnomo Yusgiantoro.

"Every year ExxonMobil's submitted its working budget and program for Natuna, but we never processed them, as the company's contract (for the block) has been expired since 2005," Purnomo said.

Purnomo said that ExxonMobil's contract was automatically terminated when the firm failed to submit a feasibility study before the Jan. 9, 2005, deadline.

Under its contract, Purnomo said, ExxonMobil was required by that date to submit a plan of commitment to continue development of Natuna field and the feasibility study as a basis for commercial viability considerations between BPMigas and ExxonMobil.

However, Purnomo said ExxonMobil submitted only the letter of commit-

ment before the deadline date.

The government's decision not to extend the 2005 contract also is based on its view that ExxonMobil failed to seriously develop the block—an accusation denied by the firm, which claims to have invested $400 million in the block.

Jakarta not worried

Indonesia also seems to be shrugging off the possibility that ExxonMobil would bring the case before the international arbitration court.

"Anybody can file arbitration, but in this case ExxonMobil has no legal basis to do so," said Alan Frederik, who heads the BPMigas legal division. "The deadline was not fulfilled, so the contract was terminated automatically."

ExxonMobil spokesman Maman Budiman said the company respectfully disagrees with the government.

"We remain interested in a resolution which allows development of this resource to proceed with the support from the government," Budiman said, adding, "ExxonMobil is uniquely positioned to develop this project efficiently in partnership with [state-owned PT] Pertamina."

In a cabinet meeting last year, the government appointed Pertamina to take over the block and to seek partners to help develop it.

However, Pertamina hesitated to undertake the work, saying it was unsure of the field's legal status and that it had no access to the block's exploration data.

Considerable uncertainty seems to prevail over the location of the data.

"As a partner, Pertamina is supposed to have the data," said BPMigas Chairman Raden Priyono. "I think the problem is with Pertamina's data management." However, a report in the local Investor Daily newspaper last week cited an executive of ExxonMobil Oil Indonesia as saying the firm will not hand over the data on Natuna D-Alpha until the termination of its contract, which it claims will be effective for the next 30 years.

Lawsuit threatened

In response, Indonesia Jan. 16 threatened to sue ExxonMobil if it fails to return all data on the Natuna D-Alpha Block development.

Citing Law No. 22 of 2001 on Oil and Gas, Purnomo said the results of an exploration and exploitation program belong to the government. "So contractors, including Exxon, may be brought to justice if they fail to submit the data to the government. If Exxon is not serious, I will sue it," he said.

Meanwhile, also on Jan. 16, a limited cabinet meeting chaired by Indonesian President Susilo Bambang Yudhoyono asked Pertamina to conduct a feasibility study on the exploitation of Natuna D-Alpha gas field.

"So, Pertamina should not be hesitant any longer," Purnomo said, adding, "There is no need for Pertamina to cast doubt on the exploitation right of the gas field." ✦

Final EIA figures show US 2007 oil reserves grew 2%

Proved US oil reserves rose by 345 million bbl, or 2%, during 2007 to 21.32 billion bbl from 20.97 billion bbl at the beginning of the year, reported the US Energy Information Administration on Jan. 28.

The increase was a contrast to the rapid decrease in domestic crude reserves that began in 1970 but which have moderated in the past decade, EIA said as it released final yearend numbers for 2007. The federal energy research and statistical service will begin gathering 2008 numbers in February when it distributes proved reserves data survey forms to more than 1,400 US well operators.

It takes about 12 months to collect the data, resolve anomalies, and develop a final report, EIA said. The latest figures do not reflect 2008's market fluctuations, when crude oil prices reached a peak of about $150/bbl before dropping to around $40/bbl, it added.

During 2007, EIA said, US producers added nearly 2.04 billion bbl of new reserves while producing more than 1.69 billion bbl, resulting in the 345 million bbl net addition. About 40% of the reserve additions were discoveries, either from discovered reservoirs and fields or by extending the boundaries of existing fields, it said. Almost all the remaining additions, or about 1.2 billion bbl, came from more intensive development of known producing fields, it added.

EIA said Alaska, Texas, and North Dakota accounted for a majority of the year's new reserves with a combined 605 million bbl of net additions. Eight other states showed relatively small increases while 13 states and the Gulf of Mexico reported declines, it said.

Alaska reported the largest net increase, 284 million bbl or 7%, according to EIA. Most of its new reserves were revisions, but the state also had the nation's largest volume of new field discoveries during the year, it said.

It said Texas had the second largest net increase—251 bbl or 5%. A majority of its 601 million bbl of reserves additions were revisions, but 30% or 183 million bbl came from new discoveries in already known fields. The state led the nation in such extensions during 2007, with most occurring in West Texas, EIA said.

North Dakota, while a relatively new oil producing state, reported the nation's third largest net addition of proved oil reserves during 2007 with 70 million bbl, 17% more than its 2006 total. The increases came primarily from the unconventional Bakken formation, a deep, predominantly shale formation that produces light, sweet crude when fractured, EIA said. ✦

IFP: Politics, money crisis to impact energy industry

In an unprecedented economic and financial crisis where "all reference marks have disappeared," the president of the Institut Francais du Petrole (IFP), Olivier Appert, ventured two "extreme" scenarios for the midterm oil scene.

If energy policies to control demand prevail and investments are maintained at a certain level, he said, oil prices could remain relatively stable around the level of conventional oil substitutes—$60-100/bbl.

But if the economic upturn is strong and the crisis discourages investments in supply as well as demand management, tensions will elevate prices to $100-150/bbl.

In the short term, Appert said, oil prices should hover at $30-40/bbl, possibly rising to $60/bbl at yearend.

In the longer term, he said, the fundamentals will not have changed: When the economy emerges from the crisis, energy demand will pick up—pulled along by emerging countries—and oil and gas supplies will remain concentrated in a small number of countries. Environmental concerns will continue to prevail.

Viewed more broadly, oil and energy markets will depend on the magnitude and length of the economic and financial crisis, he said.

Other uncertainties

Meanwhile the outlook is fraught with uncertainties: Will OPEC countries maintain their quota discipline? Can they survive the fall in demand as surplus capacity rises far higher than the previous 3 million bbl? Will further international tensions upset the oil market?

Despite falling exploration and production costs, which are beginning to be seen, oil and gas companies will be reluctant to engage in risky investments at current prices. Operators with high debts are particularly fragile, he said. However the impact on existing production remains slight as long as prices cover operating costs, he added, and supply cuts in 2009 should be small.

What is at stake is the prospect for future projects, Appert said. Oil companies are keeping a "wait-and-see" stance justified by the easing of pressure on supplies. So far the very large, long-term, strategically important projects are not being questioned.

Appert conceded that it was possible for falling oil prices to temper oil nationalism, but it would take some time for that to occur.

A new and larger impact on the energy market could be the new energy policies of US President Barack Obama. "It is too early to have a clear view of the new energy policy," Appert cautioned, but if it is pushed ahead, "US oil imports should fall by many percentage points."

He also wondered whether Russia will retain for long its role as the leading oil producer on the oil scene. He said OPEC resents Russia's "stowaway" position within the organization and that Saudi Arabia might not accept the loss of its leading role.

Gas market impacts

However Appert believes the "Gas OPEC" that Russia has masterminded will have a more than negligible impact on the market "as Russia broadens its sphere of influence with agreements with Venezuela, Algeria, and especially Caspian countries."

Two recent developments will have long-term consequences on both the LNG world market and on Europe's refining market, according to Appert. The first is North America's shale gas developments, which will impact the world LNG market as the US will likely import less gas.

The second development is the higher price of middle distillates compared to gasoline, a price expected to prevail, Appert said. As new automobile standards develop and gasoline demand falls in the US, European refineries will lose their export outlet for surplus gasoline. ✦

Semisubmersible Petrorig I on track for Gulf of Mexico

Petrorig I—the first unit of a series of four Larsen Oil & Gas ultradeepwater semisubmersible drilling rigs on order with Sembcorp Marine Ltd. subsidiary Jurong Shipyard—has completed its turnkey construction on schedule and is on track for assignment in the Gulf of Mexico. The rig is scheduled for delivery and sail-away in March for a 5-year charter with Petrobras America in the gulf.

Petrorig I was built using Jurong Shipyard's proprietary breakthrough techniques for fast-track semisubmersible construction and is a sixth-generation Friede & Goldman's Ex-D millennium class design semi capable of drilling up to 37,500 ft while operating in dynamic positioning mode in ultradeep waters of up to 10,000 ft.

The rig is equipped with an operational displacement of 43,400 tonnes at 17 m draft and 46,750 tonnes at 20 m draft, 18,000 sq ft of usable deck space, and is capable of a variable deck load capacity of up to 8,000 tonnes. Photo from Sembcorp.

Tamar wildcat finds subsalt gas off Israel

The Tamar rank wildcat well in the eastern Mediterranean off northern Israel has discovered a resource at least equal to the predrill estimate of more than 3 tcf of gas, said operator Noble Energy Inc., Houston.

Logs at Tamar-1 indicate more than 460 ft of net gas pay in three high-quality reservoirs whose thickness and quality are greater than anticipated, the company said. The well went to 16,076 ft to test a subsalt, Lower Miocene structure in 5,500 ft of water on the Matan license in the Levantine basin.

The Noble-led group plans production tests and may keep the rig to drill as many as two more wells in the basin, one of which could appraise the discovery. The companies also are considering drilling a second Lower Miocene subsalt prospect, Dalit (see map).

Tamar, a 250 sq km structure, is 60 miles from the nearest well, off Tel Aviv. James Peck described the area's geology and petroleum systems of the distal portion of the Eastern Mediterranean basin in an article in OGJ (see map, OGJ, Oct. 6, 2008, p. 41).

Tamar lies about 80 miles north-northwest of the 1999-2000 Mari-B, Noa, and Nir gas discoveries 15-23 miles off Ashkelon. It is also about 40 miles southeast of Israel's maritime border with Cyprus.

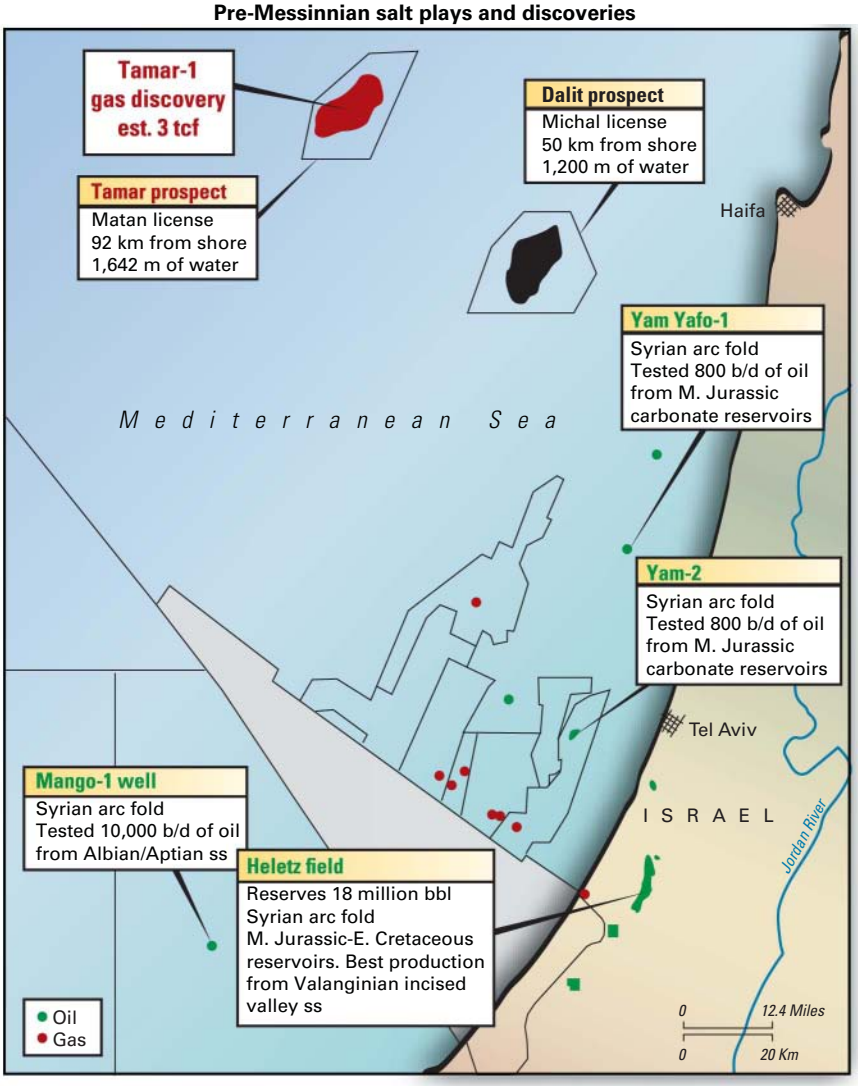
Tamar is Noble Energy's first exploration well off Israel in more than 5 years and appears to be the largest discovery in the company's history. Noble took a farmout on the Matan license 60 miles off Haifa and the Michal license containing the Dalit prospect in 4,000 ft of water 30 miles offshore in 2006.

Noble Energy is operator with 36% working interest. Other participants are Isramco Negev 2 with 28.75%, Delek Drilling 15.625%, Avner Oil Exploration 15.625%, and Dor Gas Exploration 4%.

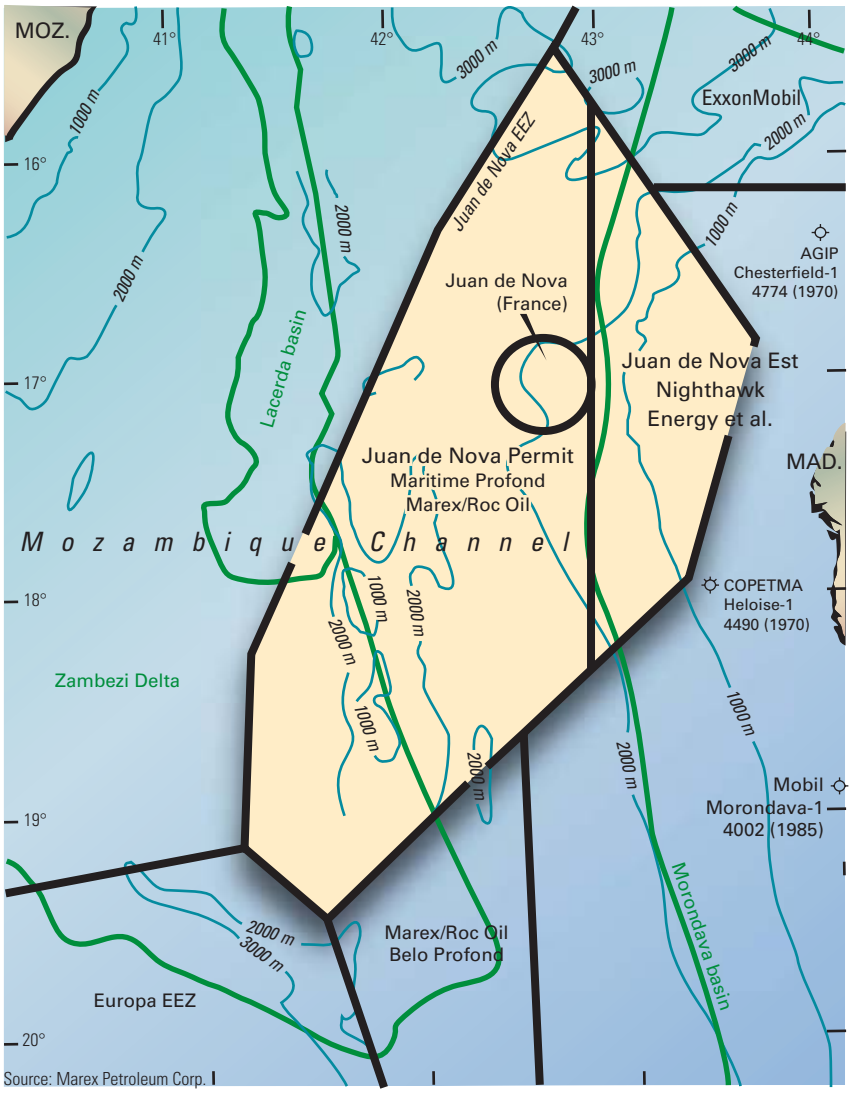
Isramco Inc., Houston, owns a 1.4375% overriding royalty interest before payout and a 2.7375% ORRI after payout in the Matan license area. ✦

TAMAR AND OTHER EAST MEDITERRANEAN HYDROCARBONS

Pre-Messinnian salt plays and discoveries



MOZAMBIQUE CHANNEL PERMITS



France awards permits in Mozambique Channel

The French government awarded two 5-year exploration permits to mid-sized oil companies to explore offshore Juan de Nova, a tiny island possession in the Mozambique Channel between Madagascar and Mozambique.

One permit was awarded to Marex Petroleum Corp., Houston, as operator, and Roc Oil Co. Ltd., Sydney. It covers 52,990 sq km, and a 12 sq mile area around Juan de Nova island is excluded. Water depth exceeds 2,000 m.

Promised financial outlay amounts to €47.3 million. The companies are committed to drilling a well in the fourth or fifth year of the permit and are planning preliminary 2D and 3D seismic exploration.

Another permit, Juan de Nova Est, in 500-2,000 m of water and covering 9,010 sq km, was awarded to Nighthawk Energy PLC operator, Jupiter Petroleum Juan de Nova Ltd., and Osceola Hydrocarbons Ltd., all of the UK. Promised financial outlays amount to €27.9 million.

The joint venture plans preliminary 2D and 3D seismic exploration and two wells within 5 years.

Some analysts foresee possible giant fields "as in Saudi Arabia" in that little known offshore area between Madagascar's heavy oil fields on the east and Mozambique's Panda and Temane gas fields on the west.

Norway's TGS-Nopec was awarded a 2-year nonexclusive permit in 2003-04 and shot seismic data in the Mozambique Channel at a cost of some €1 million (see map, OGJ, Mar. 3, 2003, p. 36). ✦

Barrett starts Paradox Gothic shale gas flow

Bill Barrett Corp., Denver, started gas sales in December 2008 from Pennsylvanian Gothic shale in the Paradox basin, where the company plans to run one rig in 2009.

Sales total 4 MMcfd of gas from three Gothic shale wells in Montezuma County, Colo. Field compression owned by a third party is expected to increase in February 2009, but high line pressure is presently inhibiting production rates.

The company is drilling its fourth horizontal well in the area. Barrett is operator with 55% working interest in the Yellow Jacket prospect.

The company reported a discovery in December 2008 when the Koskie horizontal well averaged 4.5 MMcfd of gas with 20 bbl/MMcf of condensate from Gothic on the last 10 days of a 17-day test. The Neely horizontal well flowed at the rate of 3.1 MMcfd on early tests after an eight-stage frac along its 3,655-ft lateral.

The company drilled 15H-27 Neely, a third horizontal well, in November to offset the Koskie well, and drilled a vertical well 9 miles north of Neely to obtain core and evaluate field extension.

The remote project area is 60 miles northwest of the San Juan basin and near the TransColorado and Northwest gas pipelines, with whom the company and its partner are working on long-

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Barrett said it holds 397,000 gross acres and 208,000 net undeveloped acres in the Yellow Jacket and Green Jacket prospect areas.

The company set production casing at its first horizontal well to slightly shallower Pennsylvanian Hovenweep shale on the 100% owned Green Jacket prospect, which extends into Utah. Gothic and Hovenweep are at 5,500-7,500 ft (OGJ, June 16, 2008, p. 39). ✦

Seneca third largest Marcellus shale player

Seneca Resources Corp., third largest acreage holder in the Devonian Marcellus shale gas play, plans to emerge as an operator of record this year even as it continues a joint venture with EOG Resources Inc., Houston.

Seneca will spend $40 million on the Marcellus compared with $60 million to drill 300 Upper Devonian wells in the Appalachian basin in 2009.

Its Marcellus holding has grown to 725,000 acres, most of it clustered south of Warren in northwestern Pennsylvania and much held in fee. Chesapeake Energy Corp., Oklahoma City, leads in the play with 1.2 million acres, and Range Resources Corp., Fort Worth, has 900,000 acres.

Seneca's spread includes 23,988 acres picked up at a Pennsylvania state lease sale in September 2008, most of it in Lycoming and Tioga counties in north-central Pennsylvania. The other top successful bidders at the sale were ExxonMobil Corp. 19,439 acres, Anadarko Petroleum Corp. 17,189 acres, Talisman Energy Inc.'s Fortuna Energy Inc. unit 9,339 acres, and Hunt Oil Co. 4,068 acres.

A Seneca-EOG joint venture formed in late 2006 gives EOG the right to earn 50% interest in 200,000 Seneca acres and Seneca the right to earn 50% in all of EOG's 120,000 acres.

EOG must complete prospect selection by March 2009, rather than the initially agreed December 2011. That will leave Seneca in complete control of 525,000 acres.

Seneca will operate 8-10 vertical Marcellus wells in 2009 plus starting in July several horizontal wells. Typical horizontal cost is $3.5 million/well to drill and complete. Gas in place is estimated at 30-150 bcf/sq mile, and EUR is 1-3 bcf/well. Depth of the shale is 5,000-8,000 ft.

Meanwhile, EOG must ramp up to 60 development wells/year by 2014.

Joint venture results so far are encouraging, Seneca said. Having first drilled five vertical wells, the firms are drilling their seventh horizontal well.

The first horizontal well flowed 350 Mcfd, likely victim of an ineffective frac. Well 3 made 400 Mcfd from a 1,200-ft leg in Marcellus. Well 4 did 1.4 MMcfd from a 3,500-ft lateral. The other two wells await fracs.

Seneca is a subsidiary of National Fuel Gas Co., Williamsville, NY, which plans to build a west-to-east lateral through the heart of the Pennsylvania Marcellus play within 2 years and beef up storage capability at a total cost of $1 billion.

The company is benefiting from start-up in December 2008 of the Empire Connector, which links the Millennium Pipeline in Chemung County, NY, with National Fuel Gas's system southeast of Rochester, NY. ✦

Cameroon

BowLeven PLC, Edinburgh, plans further appraisal drilling on the Isongo-E and F structures on the MLHP-7 block of the 2,314 sq km Etinde permit in the Gulf of Guinea off northern Cameroon.

The Isongo-F-1r exploration well averaged 3,371 b/d of oil on a ½-in. choke and peaked at more than 4,000 b/d with a GOR of 1,200 scf/bbl from the uppermost Miocene Isongo formation below 5,750 ft MD in 2008. Analysis indicated 137 million bbl of oil in place.

The structure continues south, and the mean initial estimate for its untested southern compartment is 142 million bbl in place.

BowLeven said the discovery "transformed the traditional perception and understanding of Cameroon's petroleum systems, which ascribed oil potential only to the northern part of the Rio del Rey basin with all acreage south of this historically considered to be gas and gas-condensate prone."

Nicaragua

Norwood Resources Ltd., Vancouver, BC, plans to twin its San Bartolo-1 indicated discovery well in Nicaragua's Sandino basin later this year after a technical reevaluation and improvement in financial markets.

Consulting petrophysicists prioritized six targets for coring and testing as follows: 6,250-80 ft, 6,370-6,420 ft, 7,225-90 ft, 2,850-2,900 ft, 5,900-50 ft, and 7,590-7,670 ft.

The consultants concluded that movable oil appears to be present and that improper testing techniques most likely account for failed tests, Norwood said.

Norwood noted that it swabbed 60 bbl of 39° gravity oil from 5,900-50 ft on June 14, 2008 and reverse circulated 13 bbl of 34° gravity oil from 6,250-80 ft on June 26, 2007.

The six reservoirs, which are normally pressured, contain nontraditional volcaniclastic, fledspathic sandstones with 10-35% hydrophilic clays with 12-18% porosity and 30-45% water saturation. Permeabilities are poorly known but appear to range from less than 10 md to 20-30 md in some of the better zones. Frac stimulation and artificial lift likely will be required.

Other zones are potentially oil bearing but are considered riskier targets until core is obtained and logs are calibrated.

BPZ Energy continues Corvina field drilling

Nina M. Rach
Drilling Editor

Houston-based BPZ Energy Inc. is testing the latest of six wells it has drilled in the 80 million bbl Corvina field off northwestern Peru. The CX11-15D well reached TD of 9,385 ft MD (6,459 ft TVD) on Jan. 1, 2009. BPZ detailed its Corvina gas-to-power project in its 2006 annual report.[1]

The company's onshore support operations and gas-fired, thermoelectric power plant are in the Tumbes region, about 850 miles north of Lima.

Peru assets

BPZ Energy, a Houston-based subsidiary of BPZ Resources Inc., controls 2.4 million net acres in three basins covered by four blocks in northwestern Peru, Z-1, XIX, and XXIII; and XXII (Fig. 1). The company is looking at different geologic plays and is using new technology to reappraise fields with known hydrocarbons on and offshore Peru. It says it has mapped 50 low-risk drilling prospects in previously explored but undeveloped fields.

Offshore Block Z-1 covers 750,000 acres in Tumbes basin and contains several named fields and additional prospects (Fig. 1).

Other operators had drilled 18 wells in Block Z-1's Albacora, Barracuda, Corvina, Delfin, and Piedra Redonda fields during the 1970s and 1980s, and those five structures tested positive for oil or gas at 6,000-12,000 ft.

Corvina field is about 40 miles south of Amistad gas field, off Ecuador in the Gulf of Guayaquil. Tenneco Inc. drilled two Corvina wells in the mid-1970s. Belco Oil and Gas Corp. drilled three wells in the late-1970s and early 1980s and built the two platforms in Corvina field.

BPZ Energy has drilled six wells at Corvina since September 2006 (see accompanying table).

The initial estimated capital budget of $132.3 million included refurbishing the Corvina CX-11 platform, rehabilitating an existing well and drilling two new wells, installing a 10-mile gas pipeline from the platform to shore, constructing gas processing facilities and a 160 Mw simple-cycle electric generating plant, and building a 40-mile gas pipeline to supply gas to third-party generators in Arenillas, Ecuador. BPZ estimated the 10-mile gas pipeline from Corvina platform to a power plant at Caleta La Cruz would cost $30-60 million (OGJ, Jan. 24, 2005, p. 39).

BPZ's 2008 capital expenditure plan included $110 million for the gas-to-power project (100% funded by IFC debt) and $105 million for exploration and development, including $52 million for drilling at Corvina.[2]

Corvina reserves

In late December 2008, BPZ announced independent estimates by Netherland Sewell and Associates Inc. of proved oil reserves at Corvina that were higher than the company's expectations and up 41% from a February 2008 estimate (OGJ Online, Dec. 29, 2008).

BPZ announced yearend proved oil reserves of 25 million bbl in Corvina field, about 20% above management guidance issued in fourth-quarter 2008.[3] The Corvina area represents 6,000 acres out of the 2.4 million net acres the company controls in Peru.

BPZ negotiated reserve-based financ-

BPZ WELLS, CORVINA FIELD Table 1

CX-11 wells	TD, ft; MD	Spud date	TD reached; well completed	Oil, b/d	Gas, MMcfd
21XD	10,457 (~8,000 TVD)	Sept. 2006	Nov. 2006; April 2007	5,900	60
16X (re-complete)	8,684	(before BPZ)	June 2007	—	20
14D	7,750	—	Aug. 18, 2007; Sept. 2007	2,400	104
18XD	8,792	Nov. 29, 2007	Jan. 1, 2008; April 2008	5,950	—
20XD	9,800 (6,400 TVD)	May 29, 2008	Aug. 25, 2008	10,268	—
15D	9,385 (6,459 TVD)	Nov. 21, 2008	Jan. 1, 2009		

BPZ's Z-1 BLOCK, OFF PERU

Fig. 1

ing from Natixis, a French corporate and investment bank created in 2006 from the merger of Natexis Banque Populaire and Ixis, and the International Finance Corp. (private-sector arm of the World Bank). Results from the 15D well could convert as much as 5-9 million bbl of probable reserves to proved, the company said.

BPZ had previously certified reserves at Corvina field (proved, probable, possible) of 60 million bbl oil (March 2008) and 284 bcf gas (May 2008).

Z-1 block history

Block Z-1 now has four offshore platforms. The water depths are shallow, averaging 200 ft; only 10% of the area has water 500-1,000 ft deep.

BPZ Energy first became involved with offshore block Z-1 in the coastal Tumbes basin in November 2001 (OGJ, Dec. 17, 2001, p. 34). Together with Tulsa-based Syntroleum Corp., BPZ signed a license agreement for the block with Perupetro, the new license contract grantor. Previously, licenses were issued by Peru's Ministry of Energy and Mines.

The Block Z-1 license provides an initial exploration period of 7-13 years. If exploration is successful, the total contract term for crude oil production can extend 30 years and for natural gas and condensates, 40 years.[2]

In July 2004, BPZ Energy assumed the operatorship of Block Z-1 and was authorized to certify the block's gas reserves. In December 2004, BPZ obtained certification of 4.02 tcf of gas potential (proved, probable, and possible) in Block Z-1.

In February 2005, the Peruvian government designated BPZ Energy as operator of the block with 100% interest. BPZ began signing agreements for gas sales. In August 2005, BPZ Energy signed an engineering, procurement, and construction (EPC) contract for a power plant project in northwest Peru with Houston-based BTEC Turbines LP.

In December 2005, BPZ Energy announced:

- Plans to redevelop Albacora oil field, in the northern part of the block.
- Signing a 24-month drilling contract with Petrex SA, Latin American subsidiary of Italy's Saipem SPA, a worldwide drilling and construction company of Eni Group, to start a drilling campaign in the Corvina gas field with a platform rig capable of drilling to 16,000 ft.

BPZ Energy paid $5.5 million to upgrade and mobilize the Petrex rig and received a "competitive fixed day rate and exclusive rights" to use the rig, at the company's option, during the 2-year period beginning with the rig's delivery in September 2006. In addition, after the guaranteed 2-year period, the company has the option to extend the contract "for an additional year at market rates."[1]

By June 2006, BPZ confirmed plans to begin drilling the offshore Corvina gas field.

Equipment

It acquired and equipped a deck barge with a 200-ton crane to transport the drilling rig from dock to platform and act as a tender for drilling operations at Corvina and other properties off Peru. BPZ energy acquired the deck barge and related equipment, including a smaller, 35-ton crane, two winches, and related spare parts for about $6 million from Seattle-based KRS Marine.[1]

BPZ also refurbished a dock in Talara, Peru, to facilitate the company's drilling and logistical operations and secured all tubular goods to meet planned needs for the first two gas wells of the initial three-well drilling campaign at Corvina.

On July 19, 2006, BPZ mobilized the Petrex rig to the Corvina CX-11 platform and spud its first well, the CX11-21XD, in September (Fig. 2).

Manolo Zuniga, president and chief executive officer of BPZ Energy, described the operating environment. "Block Z-1 is near the equator. The waters are calm and there are no hurricanes. Conditions are relatively benign."[4]

BPZ Energy has drilled six wells from the CX-11 platform in the Pacific, off northwestern Peru (Fig. 2, from BPZ Energy Inc.).

21XD well

BPZ reported that the 21XD well reached TD of 10,457 ft MD (9,234 TVD) in November 2006. During the final stages of completing the first Corvina well, BPZ reported a mechanical problem caused by a gas kick following the cementing of the 7-in. liner in the Zorritos formation. This caused cement and several joints of drill pipe to block part of the 9⅝-in. intermediate casing.[1] All obstructions were successfully cleared.

In January 2007, BPZ Energy announced that all required testing equipment had been delivered and installed at the well. BPZ ran four drillstem tests (DSTs) in February on separate potential pay zones across 413 ft in the Lower and Upper Zorritos formations. It announced results in March—40 MMcfd of natural gas and 3,150 bo/d—and temporarily completed the well as an oil producer in April 2007.

The final production test after completion yielded 5,900 bo/d with 920 psia of wellhead pressure.

BPZ spent $55.9 million to drill and complete the 21XD and 14D producing wells.[2]

16X well

The CX11-16X well was drilled before BPZ entered the Corvina field, to a TD of 8,684 ft MD.[2] In May 2007, BPZ completed the CX11-16X workover and began a series of four DSTs, including one in a formation previously untested in the entire basin.[2] BPZ completed the 16X as a gas well in June 2007 and it was making 20 MMcfd.

BPZ spent $7.1 million to drill and recomplete the 16X, run seismic, and cover other related expenses.[2]

In June 2007, BPZ leased two oil-production barges for 2 years, with options to purchase, with a capacity of 40,000 bbl each.

The company planned to use one barge, the Nomoku, as an FPSO for oil produced at Corvina and the second, the Nu'uanu, to transport produced oil to the Talara refinery, about 70 miles to the south.[2]

14D well

The CX11-14D well was spud June 21, 2007, and reached TD of 7,750 ft MD on Aug. 18, "slightly ahead of the 60-day time line," BPZ announced. The well intersected multiple prospective pay zones in the Upper Zorritos and Cardalitos formations.

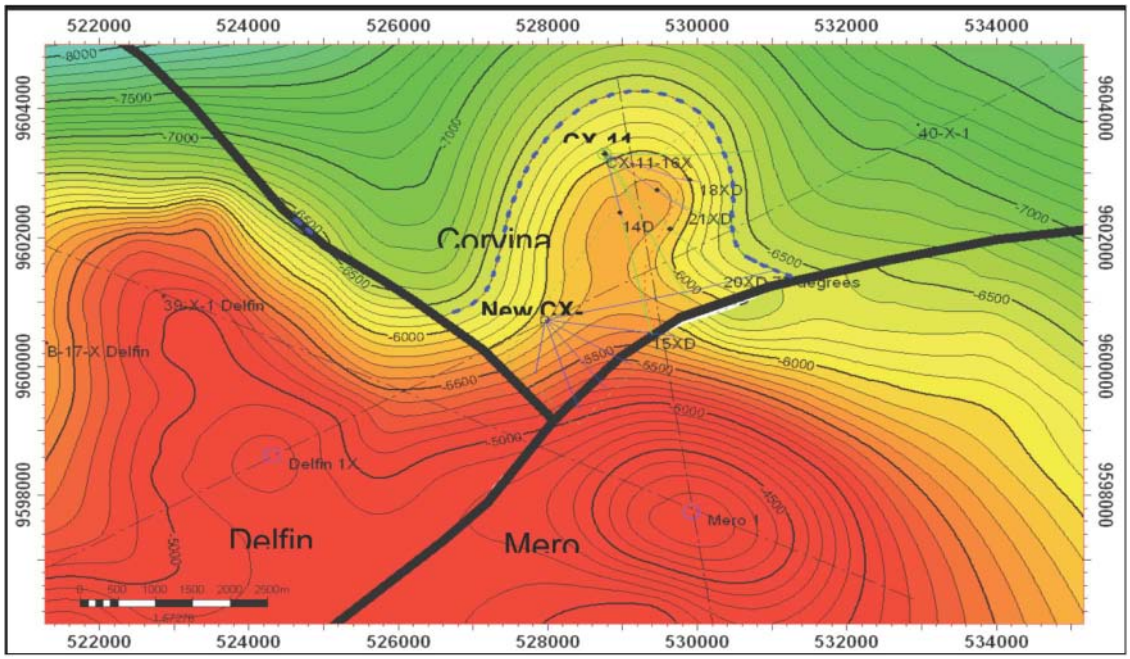
In September, the well tested 1,700 bo/d on a ⅝-in. choke through perforations in the Upper Zorritos formation at 7,150 ft. (OGJ, Sept. 17, 2007, p. 58).

BPZ announced in October 2007 that it ran seven DSTs and tested a cumulative 104 MMcfd of gas and 2,400 bo/d from the 14D well. The first six tests were in the Upper Zorritos formation, with the first two testing the oil zone and the other four testing the gas zone; the seventh test targeted the Cardalitos formation located immediately above the Upper Zorritos.[2]

The company also announced in October that it leased two tankers from the Peruvian navy to transport oil from Corvina field. This allowed BPZ to begin oil production from the Corvina platform in November 2007.

On Nov. 21, 2007, BPZ notified Perupetro of a commercial discovery in Block Z-1 field.[2]

Royalties under BPZ's contract vary from 5% to 20% based on production volumes. Royalties start at 5% if and when production is less than 5,000 boe/d and are capped at 20% if and



This structural map of the Corvina complex off Peru shows the well paths of the six wells drilled from the CX-11 platform and the location of the new CX-14 platform to the southwest (Fig. 3; image from BPZ Energy).

when production surpasses 100,000 boe/d.[2]

18XD well

In November 2007, BPZ spud the CX11-18XD well, updip from the 21XD well, which tested 60 MMcfd of gas and 5,900 bo/d.

The well reached TD of 8,792 ft MD and was completed Jan. 1, 2008. It tested 5,950 bo/d.

On Jan. 30, 2008, one of the Peruvian Navy tankers that BPZ had chartered, the 7,500-bbl capacity "Supe," caught fire and sank near the Corvina platform. It was being used to store oil produced from Corvina's 21XD and 14D wells. At the time of the accident, BPZ reported that the Supe tanker held 1,300 bbl of oil, "most of which is believed to have been burned in the fire." There was no apparent damage to BPZ facilities, but platform operations were halted and production (4,200 bo/d from the 21XD and 14D wells) and testing of the 18XD well was temporarily suspended.

On Mar. 12, 2008, BPZ received clearance from the OSINERGMIN, the government agency responsible for auditing the safety of energy investments in Peru, to resume operations at the CX-11 platform.[2]

In April 2008, BPZ announced 5,350 bo/d from continued testing of the 18XD well. In December 2008, it announced 5,950 bo/d from the well.

20XD well

BPZ spud the CX11-20XD well May 29, 2008, and reached TD Aug. 25. It has the longest step-out of any of the Corvina wells, reaching 77° toward the southeast (Fig. 3). In October 2008, the 20XD well came in better than expected as BPZ's best well yet. The 20XD well is BPZ's fourth oil-producing well in Corvina field (Well 16X is purely gas), flowing at a cumulative 10,268 bo/d from two DSTs from four different sands.

BPZ drilled the 20XD well above the assumed oil-water contact, and the well has produced 100% oil (no water).

15D well

BPZ Energy spud its most recent well, the CX11-15D, in November 2008, attempting to target the probable oil in place area.[2] It reached a total depth of 9,385 ft MD (6,459 ft TVD) on Jan. 1, 2009 (OGJ Online, Nov. 21, 2008). The well has been drilled, logged, cased, and cemented a month ahead of schedule. As a result of encouraging oil shows, BPZ said it would conduct DSTs to evaluate each sand. This could potentially prove up more reserves than originally expected, as BPZ plans to bring the well on production immediately.

Predrill estimates for the well (proved) were 6-9 million bbl, but as a result of DSTs, the well could prove up more. For context, 6-9 million bbl would mean increasing total company proved oil reserves by 24-36%.

The well's actual flow tests were not available when this article went to press but were expected by late January or early February.

New power plant

BPZ initially planned a three-phase gas development project in Peru:[1]

- Build an integrated 160-Mw Corvina gas-to-power project requiring 40 MMcfd of natural gas.
- Build a 78-km (49-mile) pipeline from Caleta Cruz, the terminal point of the Corvina field pipeline, to the city of Arenillas in southwestern Ecuador and export 75 MMcfd of natural gas to Arenillas.
- Build a 200-km (125-mile) pipeline and export 150 MMcfd to Guayaquil, Ecuador.

In June 2006, BPZ announced that it has signed a memorandum of understanding with Suez Energy Peru SA (SEP) to evaluate the sale of natural gas from BPZ's Corvina field as fuel for a

planned 180-Mw, gas-fired, thermoelectric power plant to be developed by SEP near the town of Arenilla, Ecuador.

In September 2008, BPZ signed a contract to secure new turbines for its power plant. It made an initial down payment with GE Energy for three LM6000 gas-fired turbines with an option for a fourth; delivery is expected in fourth quarter this year. Each turbine has a capacity of 45 Mw and will consume 8 MMcfd equivalent of gas feedstock.

BPZ says the power plant is expected to be fully operational May 2010.

In September 2008, Raymond James analysts said, "Assuming current power prices in Peru (about $50/Mw-hr), the equivalent gas price BPZ would receive from power sales is about $6.05/Mcf."[5]

No joint venture

Shares of BPZ soared in July 2008 after the company said it was in talks with a unit of Royal Dutch Shell PLC about jointly developing properties in Peru. BPZ and Shell Exploration Co. signed a memorandum of understanding in June 2008 to negotiate a farmout agreement with the "ultimate goal of jointly developing Blocks Z-1, XIX, and XXIII" (OGJ Online, Dec. 2, 2008).

The MOU called for Shell to commit to a three-phase exploration and appraisal program, spending up to $300 million on 12 wells to earn up to 50% of gas reserves at Mancora and deepwater leads in Block Z-1.

BPZ and Shell agreed to discontinue farmout negotiations, the companies announced on Jan. 8.

Zuniga said BPZ "will continue appraising Corvina while preparing to drill in Albacora, continue ramping up oil production, and proving up reserves." It will also continue developing the gas-to-power project, which anchors its gas monetizing strategy.

Oil sales

BPZ announced separately, on Jan. 8, a new, long-term oil sales contract with the Peruvian government to deliver about 17 million bbl of crude from Corvina field to the state-owned Talara refinery over a period of 7 years. The contract has a referential value of about $1.3 billion, according to PeruPetro.

Corvina's oil sales price will be equivalent to a basket of crude oils based on a 15-day average of Forties, Oman, and Suez blend crude oil prices (as quoted in the Spot Crude Prices Assessment published in Platt's Crude Oilgram Price Report), less $1/bbl. ✦

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Analytic approach estimates oil shale development economics

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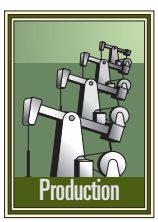


An analytical approach estimates that the minimum economic price for developing the vast US oil shale resources to be $38-62/bbl of shale oil produced. If prices go back to $60/bbl, the model indicates good economic feasibility for an oil shale industry.

Rapidly advancing conversion technologies, high oil prices, rising world demand for liquid hydrocarbons, and continued decline of US conventional oil production have all recently attracted significant attention to development of the oil shale resource. Additionally, development of this resource could benefit local, state, and national economies by means of revenues, royalties, contributions to the gross domestic product, value of avoided oil imports, and a possible shale oil production rate of about 2.4 million b/d.

This article, the third of four, describes the economics for developing US oil shale resources. Parts 1 and 2 covered the resource base (OGJ, Jan. 19, 2009, p. 56) and production technologies (OGJ, Jan. 26, 2009, p. 44) .

The concluding article in a future issue will discuss the environmental effects of developing oil shale.

OIL SHALE—3

Analytical approach

The US Department of Energy (DOE) has developed the national strategic unconventional resources model that is an analytical system for evaluating potential US oil shale development under different economic and public policy regimes.[1]

The model can perform sensitivity analyses relative to price, tax, royalty, and incentives; perform cash-flow analyses under alternative leasing options; and evaluate costs and benefits of various public policy options to stimulate oil shale project investment. The model has three detailed modules for evaluating the resource, screening the technology, and providing detailed economics.

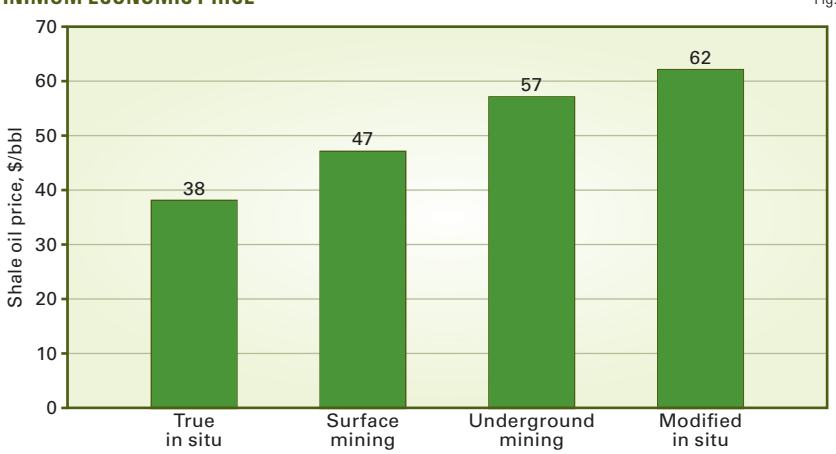
The resource module contains detailed petrophysical and geological characterestics for 25 development tracts in Colorado, Utah, and Wyoming. These tracts collectively contain in place a 70 billion bbl resource.

Detailed studies of these 25 tracts were part of the 1973 US Department of Interior prototype oil shale leasing program. Because of previous industry nomination, this article assumes that these tracts represent locations of commercial interests. These nominated tracts, therefore, provide a solid technical basis for the present analysis.

The analysis developed screening criteria for various technologies based on the geological characteristics such as depth, dip angle, yield, and thickness of the resource.

MINIMUM ECONOMIC PRICE

Fig. 1



Note: Rate of return = 15%, oil price is in 2007 dollars.
Source: Reference 5

The technologies considered are:

- Surface mining with surface retorting.
- Underground mining and surface retorting.
- Modified in situ (MIS).
- True in situ (TIS).

The analysis screened each of these 25 tracts for all technology options, assigned the most appropriate technology to each tract, and evaluated each tract under the specific process. Each tract had an assigned specific development schedule based on the type of technology applied.

The economic module uses production forecasts for each tract (based on its development schedule) for cash-flow analysis. The economic model estimates annual and cumulative cash flow before and after taxes, capital costs, operating cost, transfer payments (royalties), revenues, and profits.

The analysis then carries forward the tracts that meet the economic hurdles and aggregates the results for all remaining tracts.

The economic model uses average capital and operating costs based on the technology and development schedule during a project's life. The model considered the different technologies used for mining, retorting, and upgrading in the components of the costs.

Project costs

Oil shale projects, on a commercial scale, could range from 10,000 to 100,000 b/d for a surface retort to as much as 300,000 b/d for full-scale in situ projects. The capital and operating costs will depend on the process technology and the quality of the resource.

The model estimated operating costs of $12-20/bbl of shale oil produced.

Estimated capital costs range from $40,000 to $55,000/stream day bbl of daily capacity.[2] These costs also include mining (or drilling), retorting, and upgrading costs.

These costs pertain to operational first-generation projects and will change with time as technologies mature.

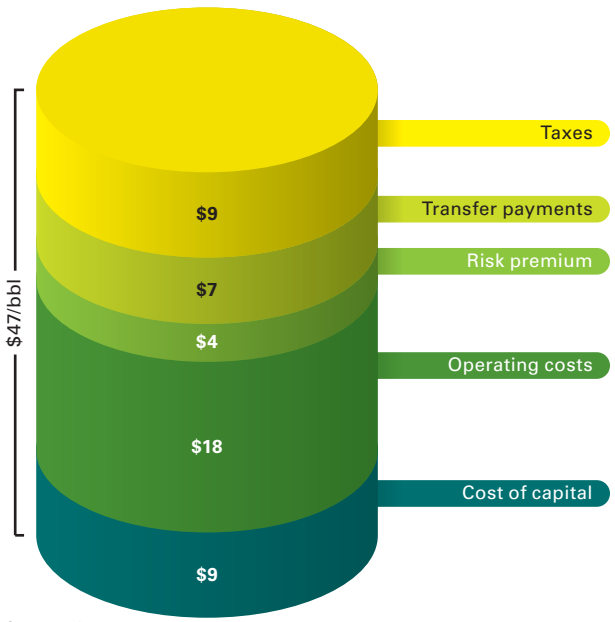
Minimum economic price

The minimum economic price is the world crude oil price needed to yield a 15% rate of return (ROR) on the project. The 15% ROR covers the capital cost and the project's technical and financial risk. The minimum economic price for oil shale projects depends on the technology used and the quality of the resource.

Under the assumptions used, for a mature 100,000 b/d capacity plant, the model estimates that the average minimum economic price is $38/bbl for true in situ, $47/bbl for surface

ECONOMIC PRICE BREAKDOWN

Fig. 2



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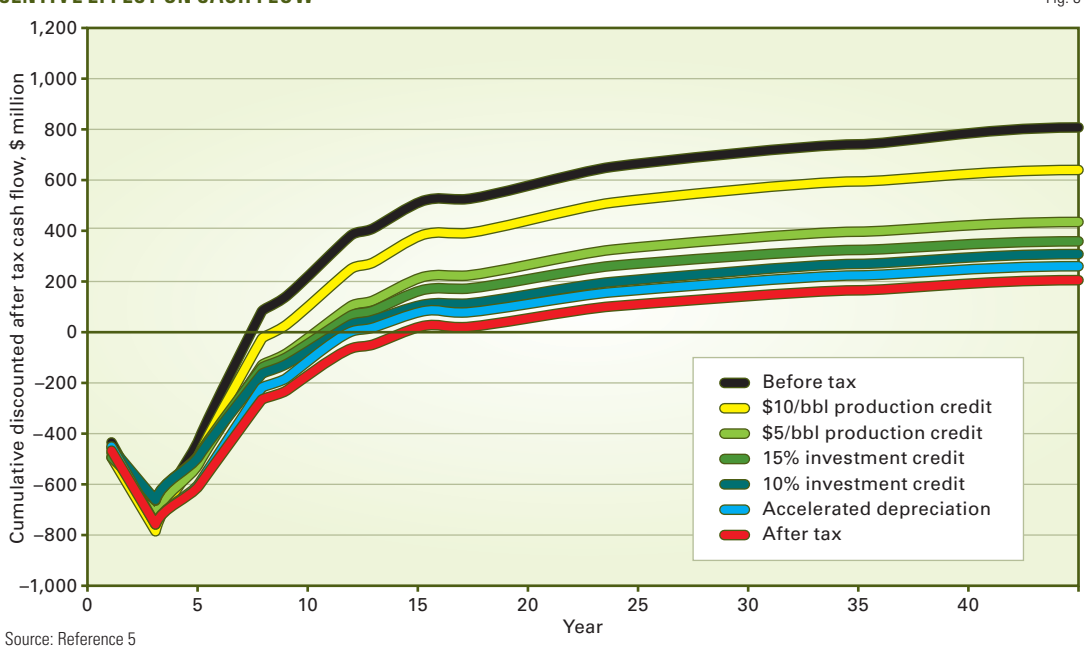
INCENTIVE EFFECT ON CASH FLOW

Fig. 3



Source: Reference 5

mining, $57/bbl for underground mining, and $62/bbl for modified in situ (Fig. 1).[2] These estimates are sensitive to both technological and economic assumptions, but discussions with industry have indicated that these estimates are reasonable.

The minimum economic price includes several components in addition to the 15% ROR and capital and operating costs. As Fig. 2 shows, a portion of the cost relates to taxes and transfer payments including royalties. The effect of taxes on a project's cash flow will determine whether the project is economically viable.

Fig. 3 displays the effects of tax credits and other incentives that the oil shale industry may receive to stimulate investment.[3]

Potential shale oil production

Three scenarios show the production potential of the 25 tracts (70 billion bbl of resource in place). These scenarios are:

1. The business-as-usual (BAU) scenario assumes no changes to current law and that future oil prices remain in the range of high $40s-60/bbl as predicted by the US Energy Information Administration (EIA) in its 2006 Annual Energy Outlook (reference price track).[4]

2. The tax incentive scenario assumes targeted tax incentives are available until project payback to encourage investments. Examples are price guarantees and production tax credits.

3. The research, development, and demonstration (RD&D) scenario assumes limited public support for RD&D and field demonstration projects at commercially viable scale to reduce project risk.[5]

Fig. 5 displays the results of the three different scenarios. Under the BAU scenario, shale oil production could reach 500,000 b/d by 2020 and would remain steady through 2035.

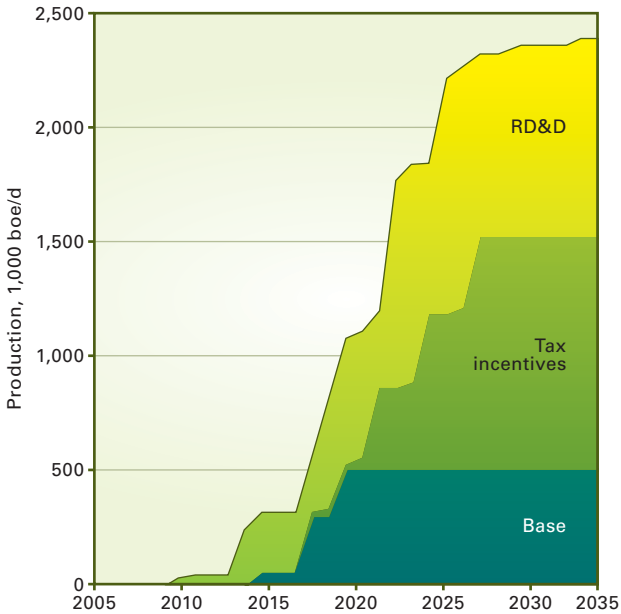
With targeted tax incentives, shale oil production could reach 1.5 million b/d by 2035.

Risk reduction through RD&D could have a positive effect on future shale oil development in the US. RD&D projects would accelerate the rate of oil shale development. With successful RD&D, the analysis estimates that the oil shale production could reach 2.4 million b/d by 2035.

Because oil shale project development requires long lead times, none of the three scenarios expects much production until 2015.[6]

In addition to shale oil, the projects could also produce much hy-

SHALE OIL PRODUCTION Fig. 4



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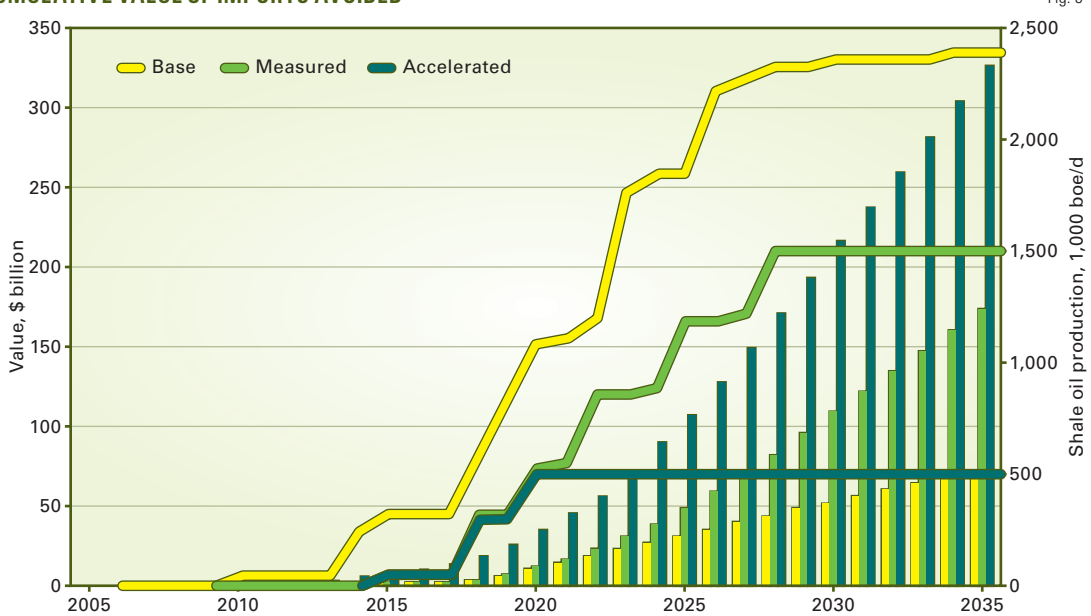
CUMULATIVE VALUE OF IMPORTS AVOIDED Fig. 5



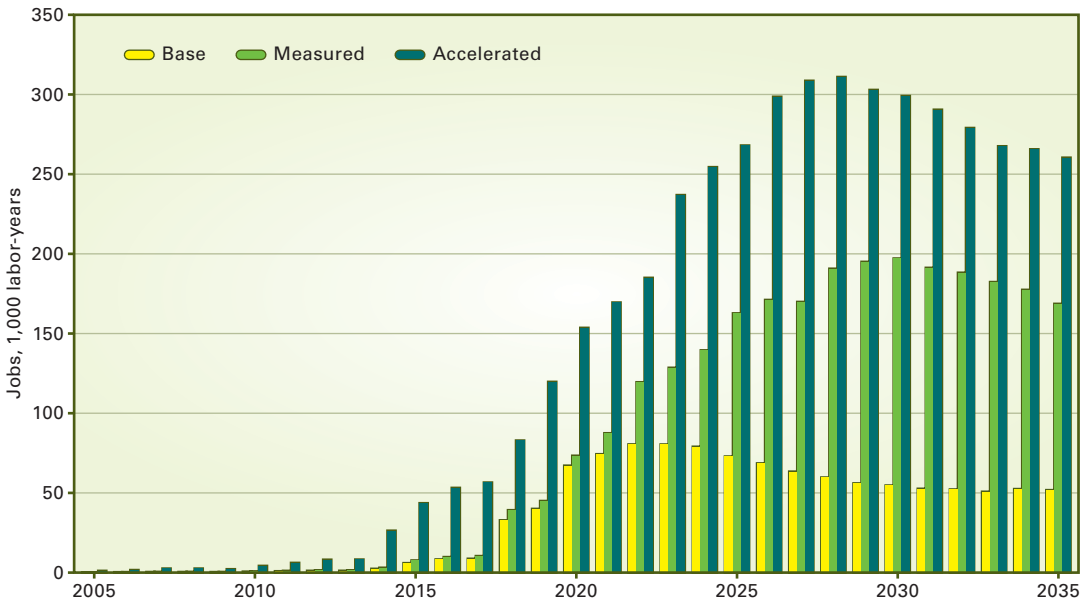
Source: Reference 5

drocarbon gas. Gas production varies as a percentage of total production depending on the surface retorting or in situ technology; however, gas production could reach 3.2 bcfd.

The oil shale projects could consume much of the produced gas for process heat, power generation, or other process requirements. Alternatively, if upgraded to pipeline quality, the gas could contribute to meeting regional and national natural gas demands.[1]

JOBS CREATED

Fig. 6



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Macroeconomic benefits

Development of an oil shale industry provides potential public benefits. Federal, state, and local governments and the overall domestic economy will benefit from direct contributions of a domestic oil shale industry and from additional economic activity and growth that will result from industry development. Direct benefits include:

- Direct federal revenues from federal taxes and federal share of royalties.
- Direct state and local revenues from state and local taxes plus the state share of federal royalties.
- The value of avoided oil imports.
- Employment.
- Contribution to gross domestic product (GDP).

Federal, state revenues

Based on the BAU scenario, direct federal revenues could reach $0.9 billion/year by 2035. With the incentives introduced in the RD&D scenario, federal revenues could reach $4.2 billion/year at the end of the 30-year period analyzed.[1]

Direct state revenues generated by the BAU scenario are $0.6 billion/year in 2035. In the RD&D scenario, state revenues could reach $2.9 billion/year by 2035.[1]

Total public sector revenues (the sum of direct federal and state revenues) could reach $1.5 billion/year for the BAU case and $7.0 billion/year for the RD&D scenario by 2035. Cumulative public sector revenues through 2035 could total $24.6 billion for the BAU scenario and $85.6 billion for the RD&D scenario.[1]

Imports avoided

The BAU scenario production of shale oil would replace about $4.1 billion/year of imported oil by 2035. The RD&D scenario would save the US $22.4 billion/year by 2035 that would have otherwise been spent on imports.

Cumulative imports avoided through 2035 are $72 billion for the BAU scenario and $325 billion for the RD&D scenario (Fig. 5).[1]

Employment

Oil shale industry development will add thousands of new, high-value, long-term jobs in construction, manufacturing, mining, production, and refining. These estimates are based on industry expenditures as well as jobs created in the petroleum sector.

Not all direct employment will be jobs new to the economy. Some will be filled by workers shifting from one sector to another. The jobs will not all be in states with oil shale development sites. Other states that design or manufacture trucks, engines, steel, mining equipment, pumps, tubular goods, process controls, and other elements of the physical complex will also share in the jobs creation.

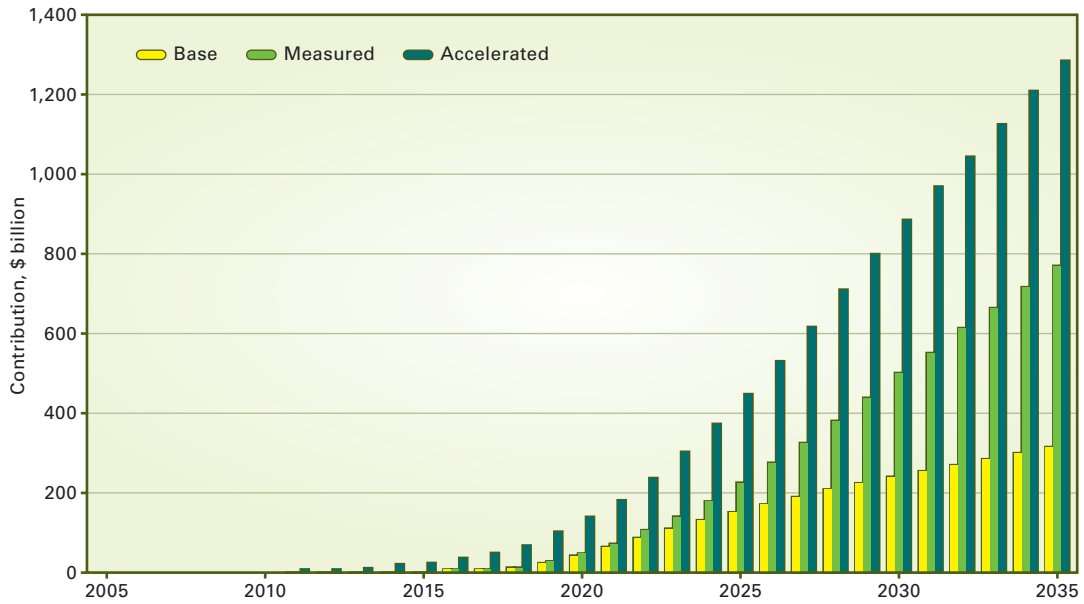
The RD&D scenario for oil shale development will create nearly 250,000 new jobs by 2035. The BAU scenario employment is less (Fig. 6).[1]

GDP contribution

These projects will contribute directly to the economy, as measured by the gross domestic product (GDP). The analysis estimates an annual contribution of $76.6 billion by 2035 for the RD&D scenario.

CUMULATIVE CONTRIBUTION TO GDP

Fig. 7



Source: Reference 5

The cumulative contribution to GDP for the BAU scenario is $313.9 billion. The cumulative direct GDP contribution for the RD&D scenario is $1.2 trillion through the year 2035 (Fig. 7).[1]

Economic analysis limitations

The economic analysis presented has several assumptions. Particularly, it is difficult to project all associated costs and benefits because there is no commercial production of oil shale in the US.

The national strategic unconventional resources model instruction manual, p. 38 (www.unconventionalfuels.org), lists the limitations, which include:

- The results pertain only to the 25 federal tracts analyzed. The analysis made no attempt to extrapolate the results to all oil shale resources in Colorado, Utah, and Wyoming. Also, the analysis assumes that these tracts are accessible for development.
- The analysis assumes that current technologies will be viable at commercial scale during the next 5-10 years. If not, the development of the resource will be impeded.
- Another assumption is that the environmental permitting process for the oil shale projects could be completed within 3-5 years. The timing of oil shale production will be affected if the permitting process is not streamlined and additional time is required.
- The analysis uses EIA's 2006 oil price projection (reference price track) during the next 25 years. Different prevailing oil prices will affect the estimated benefits. Moreover, the BAU case analysis assumes operators obtain an average minimum 15% ROR. To the extent that some operators may require different returns on their investments, the analysis may over or under estimate potential benefits.
- The economics scenarios use average costing algorithms. Although developed from the best available data and explicitly adjusted for variations in energy costs, the algorithms do not reflect site-specific cost variations for specific operators. To the extent that the average costs under or over state true project costs, the actual results will be affected accordingly.
- The estimates of potential contribution to GDP, values of imports avoided, and employment do not take into account potential effects to other sectors of the US economy from altering trade patterns. It is possible that reduced petroleum imports, depending on where the petroleum was coming from, could reduce the quantity of other goods being exported. It is likely, however, that such effects would be small.
- The analysis assumes that operators have access to capital to start and sustain the oil shale projects. Oil shale projects are capital intensive and have longer payback period relative to other oil and gas development projects. To the extent that capital is constrained, this analysis over states the potential benefit.

None of these limitations, however, invalidates the results in this analysis if one views them for their intended purpose, which is to estimate an upside potential. Given the uncertainty of the size and combinations of the optimistic and pessimistic biases introduced by these limitations, it is assumed that the approach is valid, and the estimates are reasonable. ✦

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The biographies and photos of Khosrow Biglarbigi, Hitesh Mohan, and James Killen appeared in Part 1 of this series (OGJ, Jan. 19, 2009, p. 56).

SECOND-HALF 2008

Hurricanes, economic turmoil push olefins production lower

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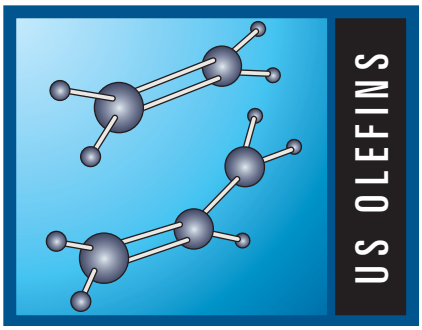
Houston

The combination of two hurricanes in the Gulf of Mexico and a decline in global economic activity caused demand and production of olefins in the US to fall sharply in fourth-quarter 2008.

Unlike the quiet hurricane season of 2007, the 2008 Gulf of Mexico hurricane season was active and two storms made landfall in Louisiana and the upper Texas coast. Hurricanes Gustav and Ike caused widespread downtime for the olefins industry during September and October 2008.

Furthermore, the dual financial storms of panic and credit crunch reached their full fury during second-half 2008. As economic activity declined globally, demand for petrochemicals fell sharply during fourth-quarter 2008 and had a more pronounced effect on olefins production and profitability than Hurricanes Gustav and Ike combined.

Olefins producers experienced the most dramatic decline ever in feedstock costs as crude oil prices fell from an all-time high of $147/bbl in July to a low of $31/bbl in late December.



Olefin plant feed slates

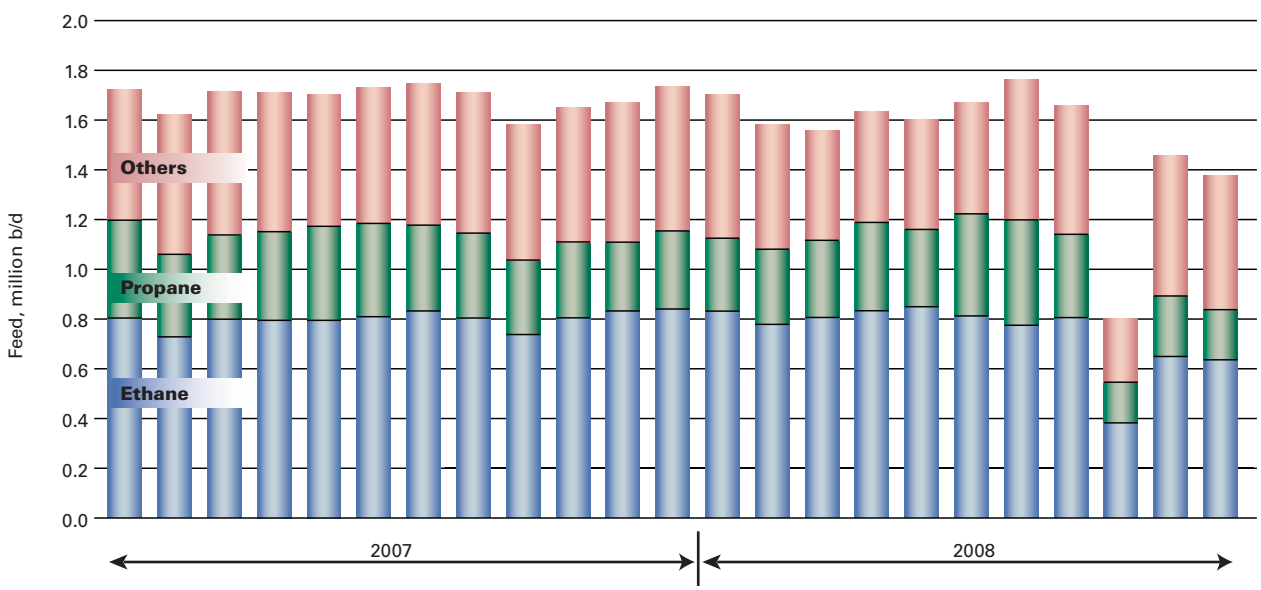
Ethylene industry demand for fresh feed averaged 1.64 million b/d in second-quarter 2008. Hurricane-related downtime in September sharply curtailed industry operations.

Demand for fresh feed fell sharply in third-quarter 2008 and averaged 1.40 million b/d. Demand averaged 1.71 million b/d in July and August but only 800,000 b/d in September.

Demand for LPG feedstocks averaged 1.26 million b/d in second-quarter 2008 but declined to 1.05 million b/d in third-quarter 2008 (Table 1). Despite the decline in LPG demand, the feed

US ETHYLENE PLANT FEED SLATE

Fig. 1



Source: Petral Monthly Olefin Plant Feedslate Survey

slate remained much lighter than during 2007.

LPG feeds accounted for 77% of total fresh feed in second-quarter 2008 vs. 74% of fresh feed in second-quarter 2007. LPG demand accounted for 75% of fresh feed in third-quarter 2008 vs. 72% in third-quarter 2007. Economics for ethane were favorable during second and third quarters 2008 and ethane's share averaged 51% of fresh feed in second-quarter 2008 but slipped to 47% in the third quarter.

Ethylene producers responded to the credit crunch and decline in demand for petrochemicals by sharply curtailing production rates beginning in October. Based on projected ethylene industry operating rates of 70-72% for fourth-quarter 2008, total demand for fresh feedstocks will average 1.35-1.40 million b/d. Total demand for LPG feedstocks will average 900,000-950,000 b/d during fourth-quarter 2008.

Fig. 1 shows historic trends for ethylene feed slates.

US ETHYLENE FEED SLATE Table 1

2008	Feed type, 1,000 b/d			
	Ethane	Propane	n-Butane	Naphthas, gas oils
April	844.4	349.7	42.1	396.3
May	854.6	311.8	57.4	380.8
June	816.8	408.3	97.7	349.4
July	783.1	422.6	119.8	435.3
August	795.9	346.3	105.6	406.8
September	385.9	161.6	39.7	207.9
October	653.3	240.4	71.7	491.4
November	642.5	199.1	46.8	473.5

Source: Petral Monthly Olefin Feedslate Survey

Ethylene production

Ethylene production from fresh feed totaled 13.2 billion lb in second-quarter 2008 but declined to 11.5 billion lb in third-quarter 2008. Ethylene production from steam crackers during second-quarter 2008 was 260 million lb more than in first-quarter 2008 (almost 3 days' output).

Production in third-quarter 2008 was 1.73 billion lb less than in second-quarter 2008 (about 19 days of production). Loss of production in September 2008 due to Hurricanes Gustav and Ike accounted for virtually all the quarterly decline in ethylene production during third-quarter 2008. Production losses due to Gustav and Ike were about 0.5 billion lb more than losses following Hurricanes Katrina and Rita in 2005.

Production from LPG plants totaled 4.81 billion lb in second-quarter 2008 and 4.36 billion lb in third-quarter 2008 (Table 2). Production in second-quarter 2008 was 43 million lb less than in first-quarter 2008 (less than 1 day of production). Production in third-quarter 2008 was 455 million lb less than in second-quarter 2008 (about 9 days of production).

Operating rates for LPG crackers averaged 89% of nameplate capacity (based on capacity of 21.6 billion lb/year) during second-quarter 2008 but only 79% during third-quarter 2008. Multifeed crackers operated at 85% of nameplate capacity (based on capacity of 39.2 billion lb/year) during second-quarter 2008 and at 71% during third-quarter 2008.

ETHYLENE FROM US STEAM CRACKERS Table 2

2008	Production, billion lb		
	LPG crackers	Multifeed crackers	Total
April	1.53	2.82	4.35
May	1.59	2.85	4.44
June	1.69	2.75	4.44
August	1.72	2.86	4.59
September	0.83	1.29	2.12
October	1.42	2.54	3.97
November	1.28	2.32	3.60

Source: Petral Monthly Ethylene Feedslate Survey

Operating rates for the industry overall averaged 86.0% during second-quarter 2008 but slipped to 74% during third-quarter 2008.

Fig. 2 shows trends in ethylene production.

US propylene production

Although industry operating rates during second-quarter 2008 were higher than in first-quarter 2008, propylene from steam crackers totaled only 2.77 billion lb in second-quarter 2008, or 168 million lb less than in first-quarter 2008 (about 5 days of production).

Furthermore, coproduct propylene production during second-quarter 2008 was almost 400 million lb less than year-earlier volumes (almost 13 days of production). Coproduct propylene supply during second-quarter 2008 was significantly less than year-earlier volumes due to record high demand for ethane and weak demand for heavy feeds.

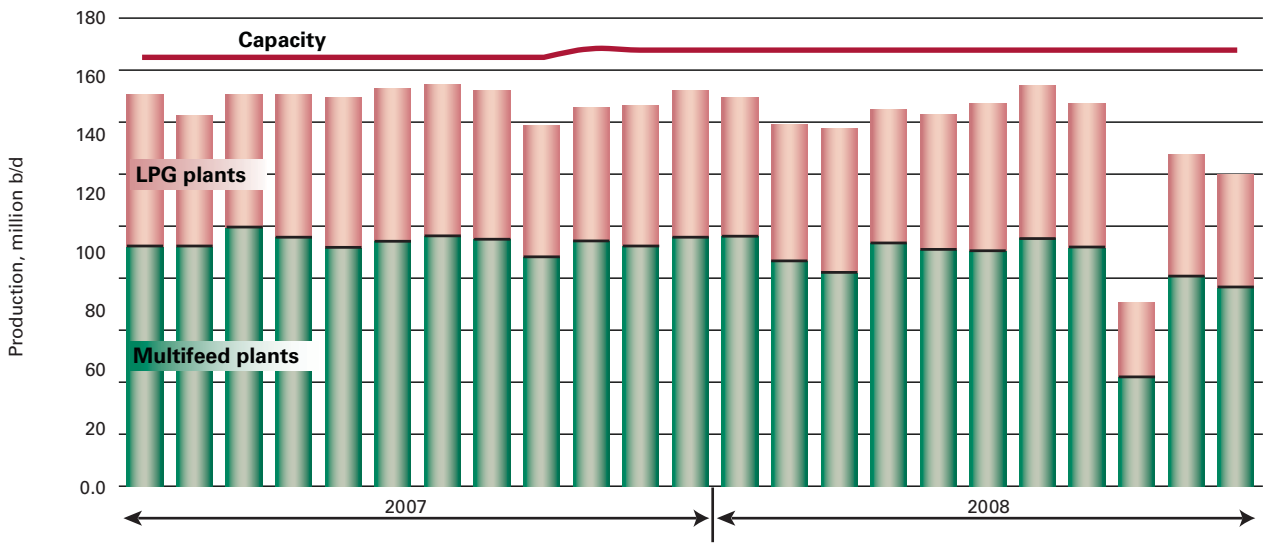
Consistent with the decline in operating rates due to the hurricanes, coproduct supply declined again in third-quarter 2008 and totaled only 2.64 billion lb, or 124 million lb less than during second-quarter 2008 (about 4 days of production).

Propylene production from LPG feeds totaled 1.37 billion lb in second-quarter 2008 and was 332 million lb more than production in first-quarter 2008. Propylene from LPG feeds, however, was 138 million lb less than year-earlier volumes. Propylene production from LPG feeds declined slightly in third-quarter 2008 and totaled 1.31 billion lb or 62 million lb less than in second-quarter 2008.

Propylene production from naphthas, condensates, and gas oils totaled 1.40 billion lb in second-quarter 2008 and was 412 million lb less than during first-quarter 2008. Coproduct yields of propylene from heavy feeds declined to 1.33 billion lb during third-quarter 2008, or 68 million lb less than in second-quarter 2008.

US ETHYLENE PRODUCTION

Fig. 2



Source: Petral Monthly Olefin Plant Feedslate Survey

Ethylene producers maximized their use of ethane during second-quarter 2008; but ethane demand declined 22% in the third quarter, while demand for all other feeds declined only 6%. On a relative share basis, heavy feeds accounted for 53% of fresh feed in third-quarter 2008 vs. 49% in second-quarter 2008.

Table 3 shows trends in coproduct propylene production from LPG and multifeed plants.

Refinery propylene supply

Refinery propylene sales into the merchant market are a function of fluid catalytic cracking unit feed rates, FCCU operating severity, and economic incentives to sell propylene rather than use it as alkylate feed.

Normally, FCCU feed rates and operating severity reach their seasonal peaks during the second and third quarters. According to US Energy Information Administration's statistics, however, US Gulf Coast FCCU feeds in second-quarter 2008 were 2.4% less than in 2007 and 14% lower in third-quarter 2008 (Table 4).

Refinery-grade propylene production during second-quarter 2008 averaged only 38.4 million lb/day and was 272 million lb less than in first-quarter 2008 (about 6.5 days of production). Production was 366 million lb less than in second-quarter 2007 (about 9 days of production).

Refinery propylene sales declined to 35.4 million lb in third-quarter 2008. Refineries in Louisiana and Texas experienced substantial downtime during September due to Gustav and Ike. As a result, total refinery propylene sales in third-quarter 2008 were 540 million lb less than year-earlier volumes (about 12 days of production).

Total domestic propylene supply was 6.23 billion lb in second-quarter 2008, which was 751 million lb lower than in second-quarter 2007. Domestic production declined in third-quarter 2008 and totaled only 5.87 billion lb, or 1.04 billion lb less than year-earlier volumes.

Fig. 3 shows trends in coproduct and refinery merchant propylene sales.

Ethylene economics, prices

Feedstock prices, coproduct values, and ethylene plant yields determine ethylene production costs. We maintain direct contact with the olefin industry and track historic trends in spot prices for ethylene and propylene. We use a variety of sources to track trends in feedstock prices.

Some ethylene plants have the necessary process units to convert all coproducts into high-purity streams. Some ethylene plants, however, do not have the capability to upgrade mixed or crude streams of various coproducts and sell some or all their coproducts at discounted prices. We evaluate ethylene production

PROPYLENE FROM US STEAM CRACKERS

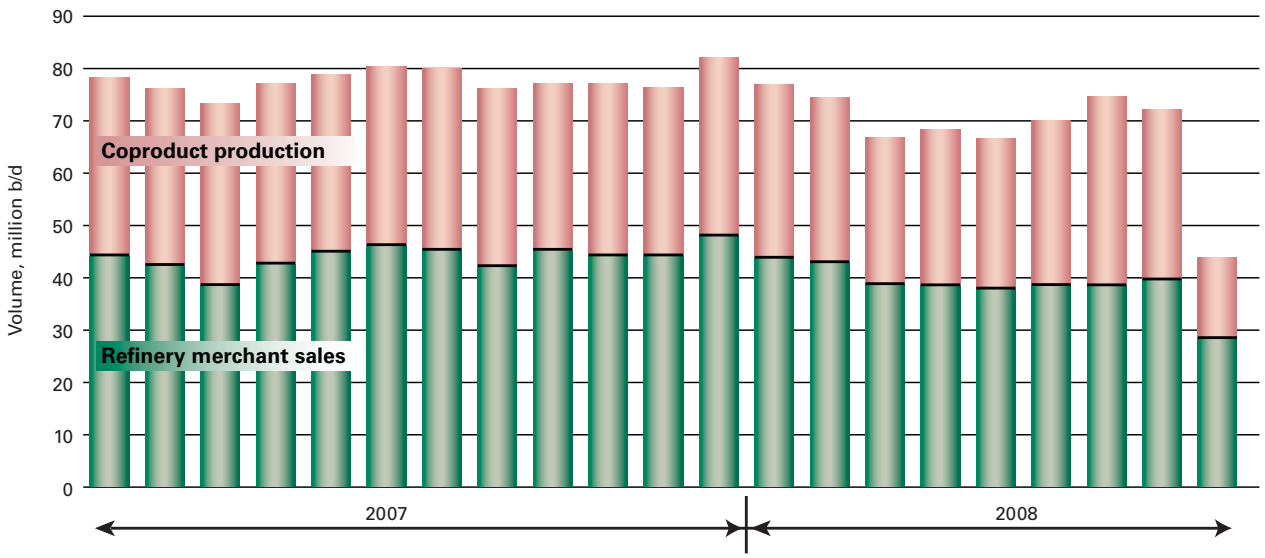
Table 3

2008	Production, million lb: LPG feeds	Naphtha, gas oil feeds	Estimated production
April	418.5	486.2	904.7
May	417.4	483.9	901.3
June	533.1	428.4	961.5
July	588.0	553.7	1,141.7
August	502.6	520.5	1,023.1
September	216.8	256.8	473.6
October	354.6	624.8	979.5
November	277.0	584.3	861.2

Source: Petral Monthly Propylene Supply Analysis

PROPYLENE PRODUCTION, SALES

Fig. 3



Source: Petral Monthly Olefin Plant Feedslate Survey

costs in this article based on all coproducts valued at spot prices.

Ethylene production costs

Production costs for ethylene in the Houston Ship Channel (based on full spot prices for all coproducts) increased 15-30% during second-quarter 2008. Production costs for ethane increased to 52-53¢/lb in June vs. 40-41¢/lb in April.

Production costs for propane increased to 49-50¢/lb in June vs. 45-46¢/lb in April. Production costs for natural gasoline increased to 70-71¢/lb in June vs. 58-59¢/lb in April. Production costs for ethane and propane were 13-15¢/lb higher than in second-quarter 2007, but production costs for natural gasoline were 30¢/lb more than in 2007.

Production costs increased to an all-time record high of 50-60¢/lb in July 2008 but fell sharply during August and September. Production costs based on purity ethane declined 36% during third-quarter 2008 and averaged 33-34¢/lb in September vs. 57-58¢/lb in July.

Production costs for propane declined 15% and averaged 41-42¢/lb in September vs. 51¢/lb in July. Production costs for natural gasoline declined nearly 43% and averaged 40-41¢/lb in September vs. 70-71¢/lb in July.

Average production costs for natural gasoline during second-quarter 2008 were 19¢/lb more than ethane and 16¢/lb higher than for propane. Although production costs for all feedstocks declined during the third quarter, natural gasoline's premium narrowed to 9-10¢/lb vs. ethane and 8-9¢/lb vs. propane (average for the third quarter).

Declines in ethylene production costs accelerated during fourth-quarter 2008. Production costs across the board were 18-22¢/lb in October and 17-20¢/lb in November.

The quarterly decline for production costs based on ethane and propane were 55-60%, and 70% for natural gasoline. Production costs in December were about 15-17¢/lb for ethane and propane and 10-12¢/lb for natural gasoline.

Although strong economic support for ethane ended during the fourth quarter, ethane's share of fresh feed in LPG crackers increased and its share of fresh feed in multifeed crackers remained steady. Production costs based on natural gasoline and light naphthas of similar quality were unusually weak during the fourth quarter due to abnormally weak prices for unleaded regular

US REFINERY MERCHANT PROPYLENE

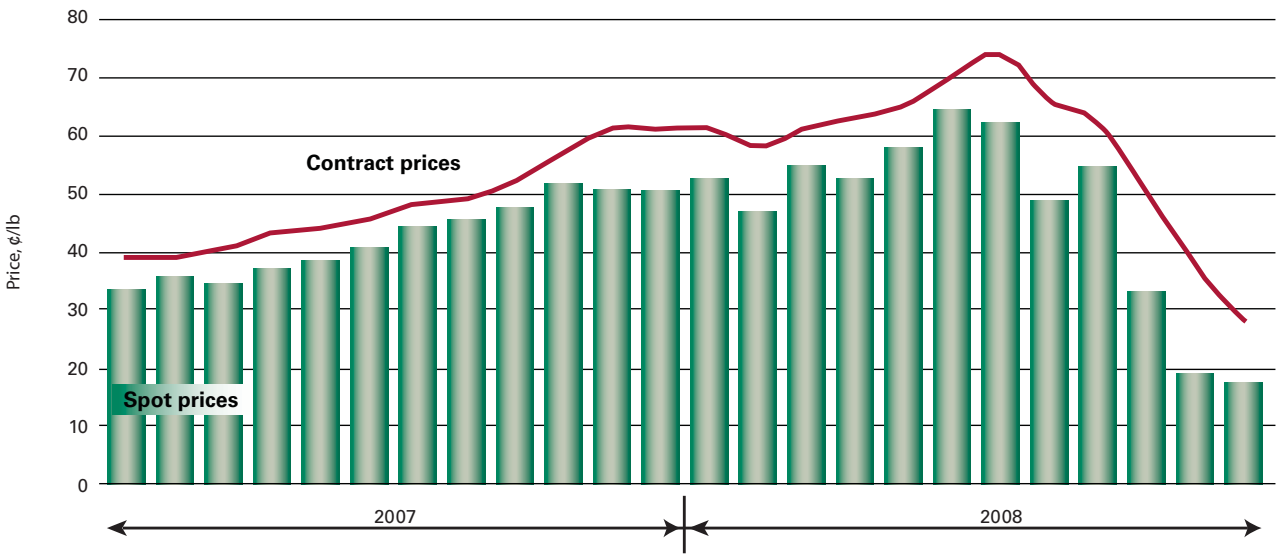
Table 4

	Sales, million lb			
2008	Texas	Louisiana	Other states	Total
April	395.7	480.6	278.6	1,154.9
May	379.4	473.8	325.9	1,179.2
June	462.3	382.5	311.5	1,156.4
July	435.3	460.3	294.5	1,190.2
August	500.1	429.8	298.6	1,228.5
September	229.5	333.8	286.0	849.3
November	437.0	468.9	302.2	1,208.1

Source: EIA Petroleum Supply Monthly

ETHYLENE PRICES

Fig. 4



Source: Petral market research

ETHYLENE COSTS, HOUSTON SHIP CHANNEL

Table 5

	Variable, direct fixed cash costs, ¢/lb				
2008	Purity ethane	Purity propane	Normal butane	Natural gasoline	Industry composite
April	40.6	45.7	37.6	58.3	44.5
May	41.6	47.5	42.2	62.6	46.3
June	52.5	49.7	43.1	70.8	53.6
July	57.9	51.1	44.2	68.0	56.6
August	45.3	47.4	37.8	57.0	47.4
September	33.4	42.2	29.8	40.6	36.8
October	21.2	21.5	14.7	19.8	20.4
November	18.6	19.5	14.7	17.1	18.2
December	17.1	16.4	10.4	12.2	15.9

Source: Petral production cost analysis and forecasts

gasoline during late September through late December.

Table 5 shows trends in ethylene production costs.

Ethylene prices, profit margins

Contract prices for ethylene averaged 66.5¢/lb in second-quarter 2008, which was 6¢/lb more than in first-quarter 2008. During second-quarter 2008, contract prices increased to 70.5¢/lb in June vs. 63.5¢/lb in April.

Contract prices averaged 67.8¢/lb for third-quarter 2008 or only 1.3¢/lb more than the average for the second quarter. Contract prices for ethylene reached an all-time high of 74.5¢/lb in July but declined in August and September. Contract prices for September settled at 62.75¢/lb.

The collapse in feedstock prices and spot prices for ethylene precipitated a belated collapse in contract prices during the fourth quarter. Contracts settled at 28.25¢/lb in December vs. 50.75¢/lb in October. For the full quarter, contract prices averaged 38.9¢/lb, or 28.9¢/lb less than the third-quarter average.

Margins based on contract ethylene prices and LPG feedstocks were stronger in the second quarter. Margins based on purity ethane production costs averaged 13.5¢/lb, or 5.7¢/lb more than in first-quarter 2008. Margins based on propane averaged 10.8¢/lb and were 5.1¢/lb. Production based on natural gasoline and light naphthas, however, generated losses of 5-6¢/lb vs. losses of 1-2¢/lb in first-quarter 2008.

Financial turmoil, the credit crunch, and a deepening recession took a heavy toll on petrochemical demand. As demand declined, profit margins for LPG feedstocks began to erode, but margins based on natural gasoline and light naphthas recovered.

Margins based on purity ethane costs fell 3.5¢/lb and averaged 9.9¢/lb. Margins based on purity propane costs declined 2.3¢/lb and averaged 8.5¢/lb. Margins based on natural gasoline, however, increased 5.8¢/lb and averaged 0.2¢/lb.

Margins for all feedstocks were weak during the fourth quarter—especially during November and December. Margins based on purity ethane and purity propane costs fell to breakeven levels in November and December. Margins based on natural gasoline, however, averaged 3-4¢/lb during November and December vs. 13-15¢/lb during September and October.

Historically, during second-quarter 2007, spot prices for ethylene fluctuated within a tight range of 50-52¢/lb

and averaged 51.2¢/lb, or 5.2¢/lb more than in the third quarter and 12.3¢/lb more than in second-quarter 2007. The higher spot ethylene prices during fourth-quarter 2007, however, did not keep pace with rising variable production costs.

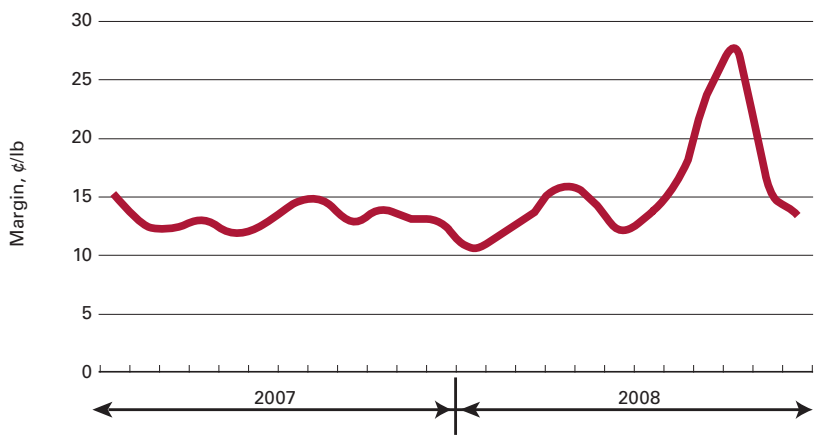
Instead, margins based on spot prices and variable production costs narrowed to 8-13¢/lb during the fourth quarter for purity ethane. Margins based on natural gasoline and similar light naphthas collapsed to 3¢/lb in December from 12¢/lb in October.

Spot prices for ethylene averaged 58.4¢/lb in second-quarter 2008 and 55.4¢/lb in third-quarter 2008. When the economic recession deepened and feedstock prices fell sharply, spot prices for ethylene fell sharply during the fourth quarter. Spot prices averaged 33-34¢/lb in October but were in the 16-20¢/lb range in November and December and averaged only 22.5¢/lb for fourth-quarter 2008, or 32.1¢/lb less than the third-quarter average.

Figs. 4 and 5 show historic trends in ethylene prices (spot and net transaction prices) and profit margins based on composite production costs.

ETHYLENE PROFIT MARGIN

Fig. 5



Source: Petral analysis

Octane values, propylene prices

We determine octane's incremental value using the differential between unleaded premium and unleaded regular (ULR) gasoline prices divided by the difference in octane (87 octane for ULR gasoline and 93 octane for unleaded premium gasoline).

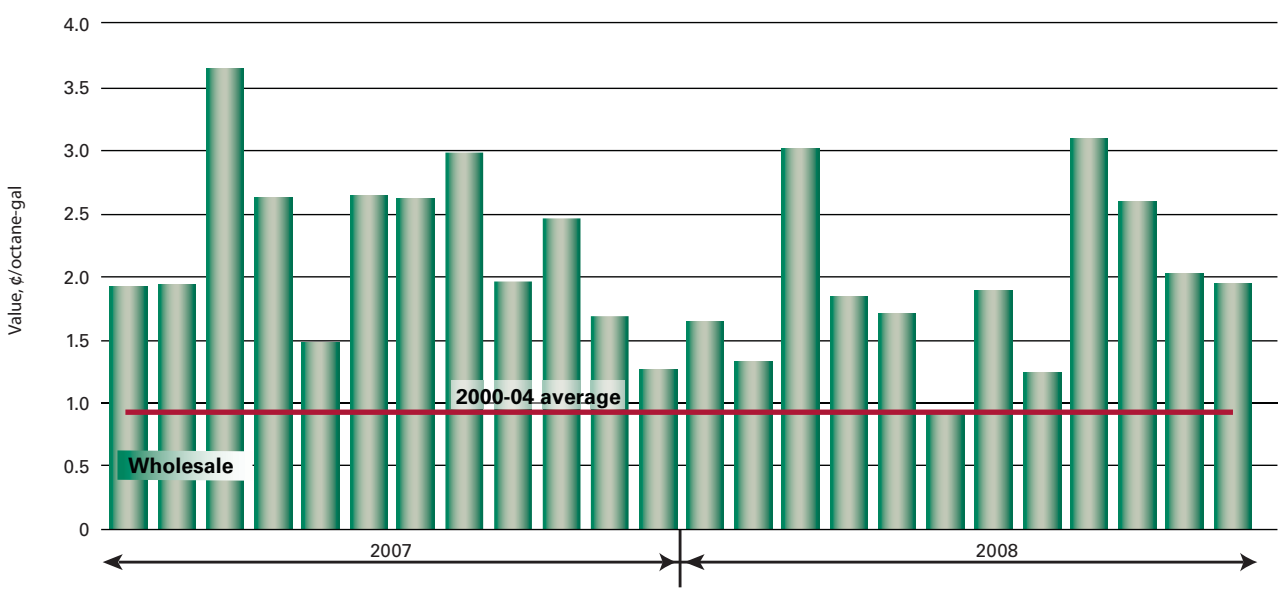
Octane values are a primary economic influence on spot prices for refinery-grade propylene and toluene. Trends in spot prices for these two products tend to influence prices for other coproducts.

Octane values weakened during second-quarter 2008 and averaged 1.48¢/octane-gal but rebounded and averaged 2.07¢/octane-gal during third-quarter 2008 and 2.06¢/octane-gal in fourth-quarter 2008.

Fig. 6 shows historic trends in incremental octane values on the US Gulf Coast.

US GULF COAST OCTANE VALUES

Fig. 6



Source: Petral analysis

Refinery, polymer-grade $C_{3=}$

Prices for all grades of propylene move in tandem with each other, and differentials between grades are generally constant within a narrow range. The premium for polymer-grade propylene covers operating costs and profit margins for the various merchant propane-propylene splitters in Texas and Louisiana.

Spot prices for refinery-grade propylene averaged 67.7¢/lb during second-quarter 2008 and were 13.6¢/lb more than the average for first-quarter 2008. The premium for refinery-grade propylene prices vs. unleaded regular gasoline prices was 18¢/lb in the second quarter vs. 14.7¢/lb in the first quarter.

Spot prices for refinery-grade propylene reached an all-time high of 76.4¢/lb in July but began to decline in August. Prices averaged 64.3¢/lb in the third quarter and fell to only 22.5¢/lb in the fourth quarter. The price premium for refinery-grade propylene vs. unleaded regular gasoline averaged 14.3¢/lb in the third quarter but only 1.8¢/lb in the fourth quarter.

Contract prices for polymer-grade propylene increased during the second and third quarters but declined in the fourth. Contract prices averaged 69.8¢/lb in the second quarter and 78.3¢/lb in the third quarter. Although contract prices for polymer-grade propylene bucked the tide of falling prices in the third quarter, a general decline in demand for petrochemicals took effect and prices fell to 36.7¢/lb in the fourth quarter.

Winter, spring 2009 outlook

The market's obsession with tight supply being the main factor in crude prices ended abruptly in July 2008. Almost overnight, the focus shifted to the combined bearish influences of financial crises, the credit crunch, and emerging global economic recession. Concerns with these problems dominated price trends for crude oil and

NELSON-FARRAR COST INDEXES

Refinery construction (1946 Basis)
(Explained on p.145 of the Dec. 30, 1985, issue)

	1962	1980	2005	2006	2007	Oct. 2007	Sept. 2008	Oct. 2008
Pumps, compressors, etc.	222.5	777.3	1,685.5	1,758.2	1,844.4	1,861.6	1,976.0	1,989.2
Electrical machinery	189.5	394.7	513.6	520.2	517.3	514.1	517.3	518.2
Internal-comb. engines	183.4	512.6	931.1	959.7	974.6	977.7	992.2	993.5
Instruments	214.8	587.3	1,108.0	1,166.0	1,267.9	1,283.5	1,364.0	1,362.8
Heat exchangers	183.6	618.7	1,072.3	1,162.7	1,342.2	1,374.7	1,374.7	1,374.7
Misc. equip. average	198.8	578.1	1,062.1	1,113.3	1,189.3	1,202.3	1,244.8	1,247.7
Materials component	205.9	629.2	1,179.8	1,273.5	1,364.8	1,350.6	1,689.9	1,566.5
Labor component	258.8	951.9	2,411.6	2,497.8	2,601.4	2,645.8	2,742.8	2,768.0
Refinery (Inflation) Index	237.6	822.8	1,918.8	2,008.1	2,106.7	2,127.7	2,321.7	2,287.4

Refinery operating (1956 Basis)
(Explained on p.145 of the Dec. 30, 1985, issue)

	1962	1980	2005	2006	2007	Oct. 2007	Sept. 2008	Oct. 2008
Fuel cost	100.9	810.5	1,360.2	1,569.0	1,530.7	1,374.7	1,921.1	1,419.3
Labor cost	93.9	200.5	201.9	204.2	215.8	201.4	292.9	260.7
Wages	123.9	439.9	1,007.4	1,015.4	1,042.8	958.6	1,157.9	1,182.0
Productivity	131.8	226.3	501.1	497.5	483.4	476.1	395.3	453.3
Invest., maint., etc.	121.7	324.8	716.0	743.7	777.4	785.1	856.7	844.1
Chemical costs	96.7	229.2	310.5	365.4	385.9	392.5	534.8	496.1
Operating indexes								
Refinery	103.7	312.7	542.1	579.0	596.5	581.0	709.3	642.8
*Process units**	103.6	457.5	787.2	870.7	872.6	816.4	1,060.1	870.4

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

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

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

The author

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feedstocks during second-half 2008.

Based on monthly averages, spot prices for West Texas Intermediate (WTI) declined almost 71% during second-half 2008. In response to the price collapse, producers around the world delayed or cancelled major projects for oil production and refining capacity expansions.

OPEC responded to the collapse in crude prices with a series of agreements to reduce their production and tighten the global crude supply-demand balance. In view of OPEC's poor historic record of compliance with its production quota agreements, WTI prices could easily range from a low of $25/bbl to a high of $50-60/bbl during first-half 2009.

We expect weakness in demand for gasoline and diesel fuel, however, to remain foremost among the concerns affecting crude prices during first-half 2009. Forecasts for ethylene production costs and prices are based on WTI prices of $40-45/bbl during first-half 2009.

Ethylene production costs (full cash costs) will be about 16-20¢/lb. Spot ethylene prices will average 22-25¢/lb. Profit margins will average 5-8¢/lb for purity ethane and 7-10¢/lb for purity propane. ✦

Testing eliminates crude line PPD use

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Solution gases and reservoir pressure can allow operation of offshore transmission pipelines carrying high pour point, paraffinic crude without pour point depressant (PPD), even during periods of prolonged shutdown. Eliminating use of PPD leads to operational savings.

This article uses the Mumbai High-Uran pipeline offshore India to demonstrate the viability of operating such systems without PPD.

Background

Mumbai High-Uran subsea crude oil trunkline (BUT) is a 30-in. OD, 203 km pipeline carrying Mumbai High crude oil to the Uran onshore terminus (Fig 1). The pipeline is buried and insulated and was commissioned in 1979. Recent data allow a reexamination of the salient aspects of its operation.

Mumbai High crude is paraffinic with an average pour point of 30° C. and wax content of 10-16% (average ≈13%). A 300-ppm PPD dose lowered pour point to 18° C. and yield to 10.2 dynes/sq cm (at 20° C.). PPD dosing also ensured easy restartability after prolonged shutdown and inhibited wax deposition. Earlier estimates placed cooling during a longer shutdown at 18° C., resulting in a high break through pressure.

Table 1 provides detailed characteristics of Mumbai High's crude oils.

Based on presentation to Offshore Technology Conference, Houston, May 5-8, 2008.

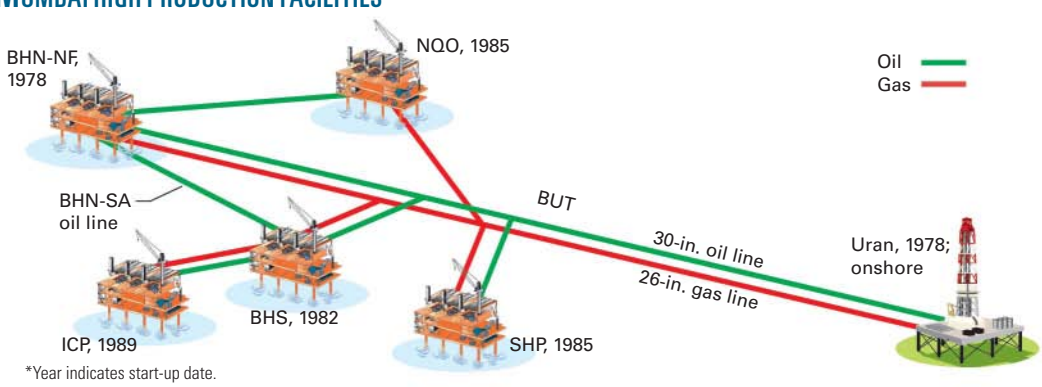
PPD requirement

A series of reports details the occasional need for PPD in the pipeline.[1] A study of the range of crude behavior in the laboratory and field integrated the latest information for the purpose of exploring flow assurance without PPD.[2]

Waxy crudes behave as Newtonian fluids above pour point temperature, exhibiting low viscosity and yield stress. Viscosity and yield value rise abruptly when crude oil cools below pour point.[3 4] Pour point's importance, however, is overstated, only showing when gel is formed but providing no infor-

MUMBAI HIGH PRODUCTION FACILITIES*

Fig. 1



*Year indicates start-up date.

CRUDE OIL CHARACTERISTICS

Table 1

	Mumbai High platforms						
	BHN	BHS	SHP	SCA	ICP	HPC	NPC
Specific gravity, 15° C.	0.8334	0.8318	0.8292	0.8313	0.8404	0.8397	0.8253
°API gravity	38.20	38.53	39.06	38.63	36.79	36.91	39.87
Pour point, °C.	27-30	30	30	30	30	33	30
Kinetic viscosity, 100° F.; cst	3.38	3.38	4.32	3.31	4.39	4.44	3.24
Asphaltene, %	0.41	0.39	0.35	0.21	0.38	1.15	0.42
Resin, %	5.23	5.80	5.98	7.10	9.80	9.40	6.89
Wax, %	13.2	14.45	15.10	10.20	11.30	16.67	13.50
Initial boiling point, °C.	57	56	72	82	78	72	71

mation about the gel's strength. Applying a small stress, even at temperatures lower than pour point, can destroy a weak wax crystal network.

Reports suggest lab yield stress values give a higher estimate of restartability pressure. Pressure and solution gas substantially improve rheology and restartability.[5 6] Assessing heat loss in pipelines becomes crucial, temperature being the single most important parameter affecting crude rheology near pour point temperatures.

Methodology

Studies conducted in an offshore laboratory and field pipeline gathered about 1,000 sets of data on the oil's behavior, pipeline shutdown conditions, bathymetry, and other subjects.

Lab and field studies focused on the following topics, integrating the results:

- Lab studies:

—Temperature's effect on PPD dosage.

—Water cut's (free and emulsified) effect on PPD dosage.

—Gas-water's effect on oil's congealing behavior.

—PPD's efficiency over time.

- Field studies:

—Studies on 16-in. OD BHN-SA well fluid line to observe oil congealing and cooling under static and subsea temperature conditions over a prolonged period.

—Data of shutdown and restarting the BUT oil line over the past 2 decades, temperature profile of the pipeline route, bathymetry, etc.

—Pour point studies under pipeline conditions.

A six-speed Fann VG meter with a programmed cooling bath performed rheology. Rheology between 34° C. and 22° C. was estimated. ASTM D-97 method determined pour point.

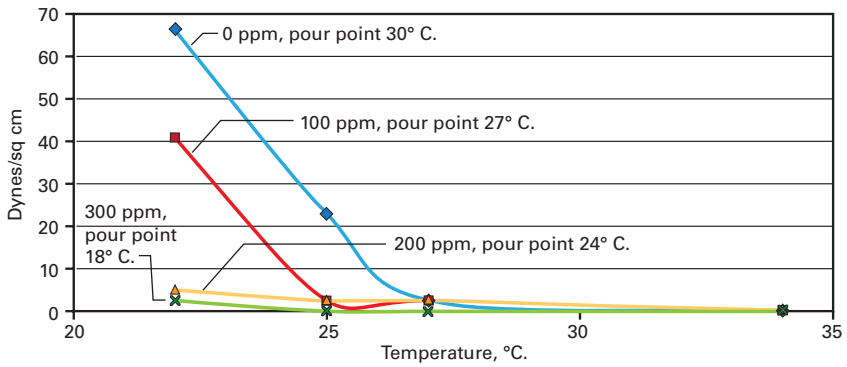
Researchers built an apparatus to measure pour point under live pipeline conditions. Oil from the separator line was directly collected. ASTM D-97 guided maintenance of cooling cycles.

Emulsion studies on an offshore platform used fresh untreated crude from the pipeline. Adding produced water and blending for 5 min prepared the emulsions. Free water studies used a 2% emulsion with water added.

Field trials occurred on the 16-in., 20 km BHN-SA subsea pipeline after it had been filled with well fluid.

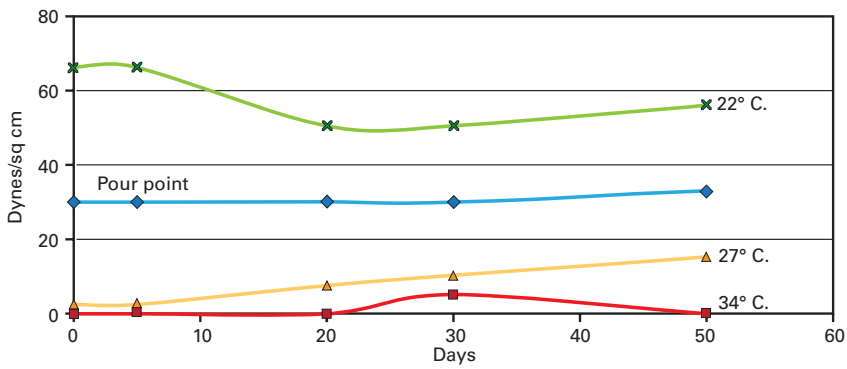
YIELD VALUE ESTIMATES, PPD CONCENTRATION

Fig. 2



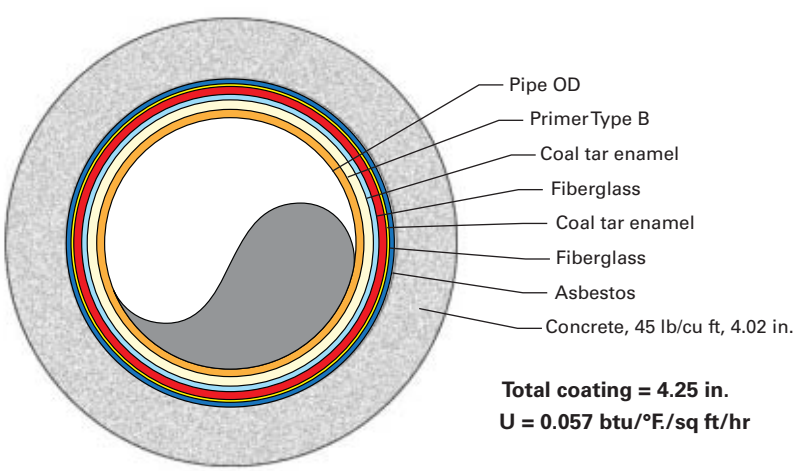
YIELD VALUES, 100 PPM PPD CRUDE

Fig. 3



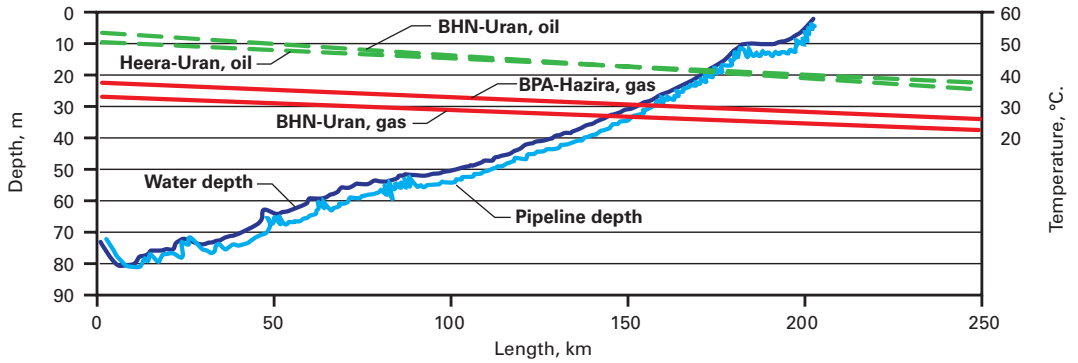
COATING, 30-IN. OD OIL LINE

Fig. 4



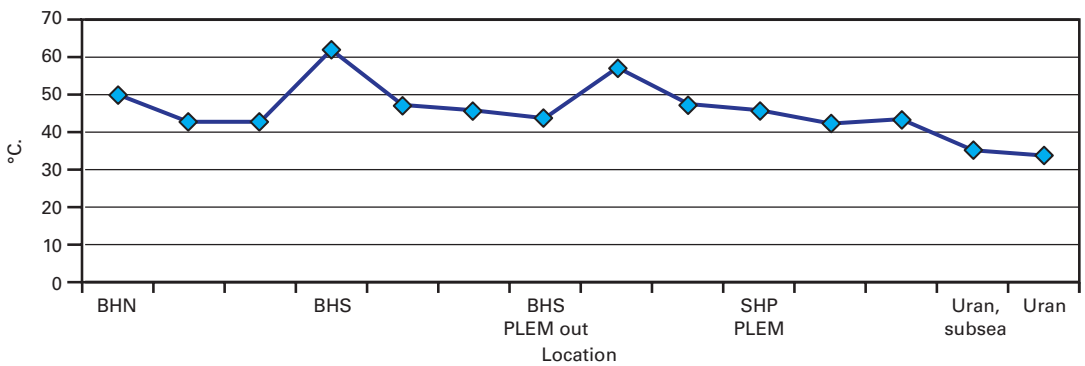
BATHYMETRY, BUT OIL PIPELINE

Fig. 5



BUT LINE TEMPERATURES

Fig. 6



Results

Yield value increase when crude oil cools. Yield value estimates of crude oil with different PPD dosages took place at different temperatures. Fig. 2 shows the results.

- Untreated crude oil shows an abrupt rise in rheological parameters when cooled below 27° C.
- PPD ≥200 ppm improves crude rheology at low temperatures (below 25° C.).
- PPD has no effect on rheological parameters at higher temperatures, as untreated crude has low viscosity and yield values at 30° C. and greater.

Water effect

Crude oil traveling through a trunkline invariably transports water. The following combinations comprehensively studied the effect of emulsified water on pour point:

- Mixing 3, 5, and 10% water to PPD-treated crude and making emulsion.
- Mixing 3, 5, and 10% water to PPD untreated crude and making emulsion.

Table 2 shows the studies' results, demonstrating water cut as not having any adverse impact on rheology at temperatures warmer than 27° C. PPD improves rheology of emulsion at temperatures 27° C. and below.

The following combinations comprehensively study the effect of free water on pour point:

- Mixing 2, 5, and 10% water (free water) in 2% emulsion of untreated crude.
- Mixing 2, 5, and 10% water (free water) in 2% emulsion of PPD treated crude

Table 3 shows the results, yielding the following conclusions:

- Free water association deteriorates rheology of crude

WATER, PPD EFFECTS

Table 2

Water content, %	PPD dose, ppm	Pour point, °C.	Plastic viscosity, cp			Yield value, dynes/sq cm		
			34° C.	27° C.	22° C.	34° C.	27° C.	22° C.
0	0	30	3.5	14	16	2.55	15.3	56.1
3	0	30	3.5	15	18	0	30.6	66.3
5	0	30	4.5	14.5	20	0	30.6	66.3
10	0	33	4.5	14	21	0	30.6	91.8
0	100	27	4	4	14.5	0	0	48.45
3	100	27	4.5	4.5	17	0	2.55	53.55
5	100	30	3.5	3.5	16	0	2.55	56.10
10	100	30	4.5	4.5	18	0	2.55	63.75
0	200	27	3	3	17	0	2.55	35.70
3	200	24	3.5	3.5	16.5	0	0	43.35
5	200	24	4	4	12	0	0	17.85
10	200	24	3.5	3.5	13	0	0	12.75
0	300	24	3.5	3.5	14	0	0	12.75
3	300	21	3.5	3.5	14	2.55	0	7.65
5	300	21	4	4	9.5	0	0	7.65
10	300	24	5	5	11	0	2.55	7.65

Free water rheologic effect

Table 3

Free water, %	PPD dose, ppm	Pour point, °C.	Plastic viscosity, cp				Yield value, dynes/sq cm			
			34° C.	27° C.	25° C.	22° C.	34° C.	27° C.	25° C.	22° C.
0	0	30	3.5	10.5	14.5	17	0	12.75	48.45	63.73
2	0	30	3.5	11.5	15	16.5	0	15.3	45.9	61.2
5	0	30	3.5	13	19	17	0	20.4	58.65	76.5
10	0	30	3.5	12	14	16.5	0	20.4	40.8	66.85
0	300	21	3.5	5.0	—	11	0	2.55	—	7.67
2	300	18	3.5	4.5	5	9.5	0	2.55	2.55	7.67
5	300	21	3.5	3.5	5.5	9.0	0	2.55	2.55	2.55
10	300	18	3.5	5.5	6.5	11.5	0	2.55	2.55	10.2

Field-trial results

Table 4

Aging period	BHN platform		SA platform		Dispatched oil, b/d
	Pressure, kg/sq cm	Temperature, °C.	Pressure, kg/sq cm	Temperature, °C.	
>2 years	12.68	52	12	25	3,000
18 days	17.80	52	16.6	26-27	5,400
20 days	10.35	52	10	24-25	2,800
83 days	3.61	--	--	22-23	Displaced with gas

oil marginally.

• PPD improves crude oil rheology in emulsions as well as in free water association.

Temperature near platforms

Table 5

Platform	Depth, m	December 2001 Temperature, °C.	March 2002 Temperature, °C.
BHN	57	22.13	26.30
NQO	55	22.38	26.46
ICP	69	21.90	25.41
BHS	70	22.02	25.37
SHP	65	22.31	26.90
BLQ	48	25.37	26.67
NLM	50	26.32	27.12
HRA	50	27.23	28.08

Gas, pressure

Crude oil pumped in the BUT line is not stabilized. Pumping occurs directly from surge tanks maintained at 4 kg/sq cm. Pour points estimated on stabilized crude do not reflect pipeline conditions where dissolved gas and pressure are present, mandating in-line testing.

The pipeline's pour point measured 27° C., 3° C. less than stabilized crude. The combined effect of lighter components and pressure reduced pour point by the 3° C.

Aging

Pipeline shutdown subjects crude oil to aging, which may deteriorate its rheology. Studies therefore occurred on PPD treated and untreated crude 5, 20, 30, and 50 days old.

Fig. 3 shows yield values, demonstrating:

• Both PPD treated and untreated aged crude show only marginal increase in yield value.

• Above 27° C., crude rheology doesn't deteriorate after aging for 30 days.

• Yield increases marginally when crude ages for more than 30 days.

Crude pour point doesn't change after aging.

Cooling rate

Experiments at slow cooling rates sought to determine crude behavior in such pipelines. The BUT pipeline cools from 50° C. to ~35° C. in 48 hr. Slow cooling results in a 3° C. lower pour point compared with ASTM-D-97. Lighter fractions present in the pipeline further depress pour point.

Field studies

The 16-in. OD, 20 km long BHN-SA subsea pipeline, filled with well fluid for more than 2 years, provided the location for field studies. Well fluid displacement used pressurized crude with a polypig in front, after which the line was kept static. Allowing 18 days to elapse resulted in 50% of line's volume being displaced. Temperature and pressure readings and samples received at the SA end allowed analysis of pour point, viscosity, and yield value. Returning the line to a static condition for 20

Average monthly pressure, URAN

Table 6

Year	January	February	March	April	May	June	July	August	September	October	November	December
	kg/sq cm											
1995	13.5	13.2	13.7	—	—	13	14	13	—	14	14	14
1996	14	14	—	—	—	—	—	13	12.7	12.7	—	—
1997	—	—	—	—	—	—	—	—	—	—	12	12
1998	12	—	—	—	12	—	—	12	11.7	11.7	12	11
1999	11.7	10.7	11.5	11.7	12	12	12	12	11.7	11.5	12	12
2000	11.5	11.7	11.7	11.2		13	12	12	11.2	11.2	12	12
2001	—	11.2	11	10.7	10	10	10	11	9.7	9.5	10	11
2002	11	10.7	11	12.1	11	11	11	11	10.6	10.9	—	—
2003	11	11	11	11	11	11	11	11	11	11	11	—
2004	11	11	11	11	11	11	11	11	11	11	11	—

more days resulted in additional crude displacement. A final shutdown left the pipeline idle for a total of 83 days. Table 4 shows field trial results.

Restart required minimum pressurization and oil was free flowing. Pressures at BHN and SA remained stable throughout the process. Pressure drop during the last phase of flow during field trial measured just 3.61 kg/sq cm. Minimum temperature observed was 22-23° C. This section of the pipeline is deepest and experiences maximum cooling.

Historical shutdowns

Following an accident on NF riser on May 16, 2003, pipeline repair and return to operation took 16 days. The pipeline was initially charged with water followed by crude oil from all platforms. Minimum crude oil temperature observed at the Uran end measured 28° C. In-pipeline heat losses were less severe than anticipated.

Oil between the BHN and BHS platforms (13.08 km) remained stagnant for 177 days during a 2001 revamping of BHN platform. After the wells were opened, fluid lines showed no increase in pressure.

The 30-in. OD BUT oil line ruptured Aug. 10, 2003, and was recommissioned Sept. 9, 2003. Oil inside the pipeline was predominantly untreated, with a PPD dose of only 30-40 ppm. Restart from BHN platform used water pumped at 300 cu m/hr. Pressure gradually rose to 9.3 kg/sq cm from 2 kg/sq cm on Sept. 10, 2003. End pressure at Uran increased to 6.5 kg/sq cm from 1.5 kg/sq cm when oil started flowing at 70 cu m/hr.

The pressure differences show oil in the pipeline had not gelled and continued to behave in a Newtonian manner. Temperature observed at Uran measured 29-30° C. after 30 days of pipeline shutdown, showing much less severe cooling than anticipated.

Bathymetry, temperature

BUT oil pipeline runs through water depths ranging from 80 m in Mumbai High North field to shore at Uran. The line lies 3-4 m below the seabed. Fiberglass, asbestos felt, and 4 in. of cement coat the pipeline (Fig. 4).

Average dispatch temperature of crude oil at various platforms measured 50-52° C. Crude temperature at Uran varies between 33° and 36° C., showing lower heat losses. Good insulation and higher subsea temperatures near shore helped reduce heat loss.

Table 5 shows water depth and maximum-minimum temperatures at various platforms en route to BUT line. Minimum temperature is above 25° C. near BLQ, NLM, and HRA platforms. Heat loss is greater at the Mumbai High end and decreases as oil travels toward Uran (Figs. 5-6).

Case histories of BUT pipeline show crude temperature dropping to only 27° C. even after 30 days shutdown, less severe than anticipated. Crude oil viscosity and yield value are quite low at 27° C., reducing the need for PPD-flow improver. Reducing PPD by 50% since January 2003 has not caused a pressure drop (Table 6).

PPD dosing halted in 2005, saving $12 million/year in operating expenses.

Acknowledgment

The authors are grateful to ONGC for according permission to publish these studies. ✦

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Partnership offers seismic interpretation

Seismic Micro-Technology Inc. (SMT), Houston, has become an independent software vendor (ISV) partner with Hewlett-Packard (Canada) Co., Calgary, whereby HP Canada will supply PC-based hardware, work stations, high-end graphics cards, and high-end mobile work stations to SMT customers to maximize the performance of KINGDOM, SMT's seismic interpretation software.

By offering KINGDOM, SMT says it is enabling geoscientists to handle even larger amounts of seismic data and increasing their productivity. "When users are loading six-figure well data, a common practice in our industry, a fast machine is essential to the interpretation and decision-making process. KINGDOM on HP hardware will significantly increase productivity on the desktop, while reducing the cycle times and lowering exploration and operating costs," the company notes.

SMT KINGDOM operates on all 64-bit and 32-bit Windows-based platforms available through HP Canada. Customers who wish to migrate to a 64-bit environment also have the ability to simultaneously run 32 and 64-bit applications.

Source: **Seismic Micro-Technology Inc.,** 8584 Katy Freeway, Suite 400, Houston, TX 77024.

Clean energy development alliance formed

CrystaTech Inc., Austin, has entered into a 5-year agreement with the Gas Technology Institute, Des Plaines, Ill., for the development of several new clean energy technologies at GTI's 18-acre research and development facility in Des Plaines.

Terms of the agreement call for GTI and CrystaTech to cooperate in the development of technologies for sulfur capture and recovery, with CrystaTech having access to GTI's facilities and the experience and capabilities of the GTI team. These ecofriendly technologies include:

- CrystaSulf downhole sulfur removal: a regenerable process for the continuous removal and recovery of sulfur depositions in sour gas wellbores. CrystaTech is modifying its patented CrystaSulf hydrogen sulfide removal process to develop the new technology for this downhole application.
- CrystaSulf blue sky: a regenerable process for the elimination of SO_2 emissions from natural gas plants. CrystaTech is integrating a catalytic process with CrystaSulf to eliminate acid rain caused by natural gas plant SO_2 emissions.
- Mobile sulfur recovery unit: a mobile regenerable process for the safe testing of sour gas wells. CrystaTech is integrating a direct oxidation catalyst with CrystaSulf in developing this mobile sour gas processing technology.

CrystaTech is partnering with federal governments and large energy companies in the joint development of the new ecofriendly technologies. Three demonstration projects are targeted in the Middle East, Canada, and China.

Source: **CrystaTech Inc.,** 8834 Capital of Texas Highway N, Suite 214, Austin, TX 78759.

Global Industries Ltd.,

Houston, has appointed two executives to lead the company's commercial growth strategies, marketing, and business development activities. Eduardo Borja will rejoin Global as senior vice-president, global marketing and strategy, and John Katok will serve as senior vice-president, worldwide business development. Borja will be responsible for strategic planning, development, and implementation of the company's growth strategies, including marketing of the company's services for deepwater applications. He first joined Global in 2001, serving in leadership positions in both operations and business development in Latin America. He was named vice-president, Latin America, in 2002 and served in that role until mid-2008 when he resigned from Global. He holds a master's in construction management from Universidad Iberoamericana and a bachelor's in civil engineering from Universidad Nacional Autonoma de Mexico. Katok will lead Global's efforts to enhance customer satisfaction by developing processes to improve client sponsorship, project planning, and project execution. He joined Global in early 2008 after 6 years with Technip Inc., where he served as commercial vice-president. Previously, he spent more than 25 years with Kellogg, Brown & Root in a variety of commercial, project management, and operational roles. Katok has a BS in civil engineering from West Virginia University.


Borja


Katok

Global Industries is a leading provider of solutions for offshore construction, engineering, project management, and support services, including pipeline construction, platform installation and removal, deepwater/SURF (subsea umbilicals, risers, and flowlines), IRM (inspection, repair, and maintenance), and diving to the oil and gas industry worldwide.

Smith International Inc.,

Houston, and Sub-One Technology, Pleasanton, Calif., have announced that they will jointly commercialize the application of Sub-One's advanced InnerArmor coating technology for oil country tubular goods (OCTG) applications. The joint venture, Smith InnerArmor Coating Services (SIACS), has the exclusive license to supply a full range of OCTG coatings globally. InnerArmor coatings, which are applied to the internal surfaces of metallic components such as pipes, tubes, and other cylindrical items, increase resistance to corrosion, erosion, wear, and/or fouling. With a low friction coefficient, the coatings also improve flow properties for liquids and gases. By delivering InnerArmor coatings for the OCTG market, SIACS will enable its oil and gas customers to meet demanding E&P environments. Typical applications would entail coating production tubing in sour gas environments and in scale-prone wells and coating drill strings to reduce erosion and friction pressure loss.

Smith is a leading worldwide supplier of premium products to the oil and gas E&P industry, the petrochemical industry, and other industrial markets, operating through MI SWACO, Smith Technologies, Smith Services, and Wilson.

Sub-One is the market leader in advanced coatings for internal surfaces. It has developed a patented process and state-of-the-art systems for depositing its advanced coatings onto the internal surfaces of a broad spectrum of products ranging from small, complex components to long, large-diameter industrial piping, in particular pipe coating to combat pipeline corrosion.

Hunting PLC,

London, has sold its Canadian midstream unit Gibson Energy Holdings Inc. to a company owned by the Riverstone/Carlyle Global Energy & Power Fund for $1.258 billion (Can.).

Hunting is an international energy services provider to the world's leading oil and gas companies in the upstream and midstream sectors, with four businesses: well construction, well completion, E&P, and petrochemical equipment. Gibson has five divisions: terminals and pipelines, truck transportation, marketing, asphalt refining/well site fluids, and propane marketing and distribution. Riverstone is a New York-based energy- and power-focused private equity firm founded in 2000 with about $14.8 billion under management. Riverstone conducts buyout and growth capital investments in the midstream, upstream, power, oil field services, and renewable sectors of the energy industry.

Wellbore Energy Solutions (WES),

Lafayette, La., has extended an agreement with DrawWorks LP to market and supply the DPC drill pipe circulating and flowback system to the Gulf of Mexico region. The DPC tool is a bail-mounted system that eliminates the need to make top drive connections to manage flowback of drilling fluids. It is applicable while running tight-tolerance casing liners, pumping or circulating on demand, or expanding casing.

WES is an oil field service company specializing in the rental of wellbore cleanup equipment throughout the Gulf of Mexico region and internationally.

DrawWorks designs, develops, manufactures, and sells products that assist in the running of tubulars in the finished wellbore, such as drill pipe, liners, casing, and tubing.

InterMoor Inc.,

Houston, has secured the exclusive license for torpedo pile technology in the US from Brazil's state oil company Petroleo Brasileiro SA (Petrobras). In the last 8 years, Petrobras has successfully installed more than 1,000 torpedo piles—essentially gravity-embedded cylindrically shaped projectiles—in order to anchor deepwater flowlines and facilities off Brazil.

InterMoor, an Acteon company, is a leading supplier of mooring technology, providing innovative solutions for rig moves and mooring services, including engineering and design, fabrication, and subsea installation.

Acteon is a group of specialist engineering companies serving the global oil and gas industry.

Imports of crude and products

	Districts 1–4		District 5		Total US		
	1-16 2009	1-9 2009	1-16 2009	1-9 2009	1-16 2009	1-9 2009	*1-18 2008
	1,000 b/d						
Total motor gasoline	1,144	791	10	6	1,154	797	1,228
Mo. gas. blending comp.	948	673	10	6	958	679	826
Distillate	362	215	0	0	362	215	242
Residual	293	431	177	0	470	431	576
Jet fuel-kerosine	64	10	5	0	69	10	56
Propane-propylene	215	131	23	29	238	160	222
Other	491	626	(23)	82	468	708	448
Total products	**3,517**	**2,877**	**202**	**123**	**3,719**	**3,000**	**3,598**
Total crude	**8,555**	**8,627**	**1,311**	**1,102**	**9,866**	**9,729**	**10,156**
Total imports	**12,072**	**11,504**	**1,513**	**1,225**	**13,585**	**12,729**	**13,754**

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

Purvin & Gertz LNG netbacks—Jan. 23, 2009

Receiving terminal	Liquefaction plant					
	Algeria	Malaysia	Nigeria	Austr. NW Shelf	Qatar	Trinidad
	$/MMbtu					
Barcelona	11.46	9.46	10.69	9.36	10.01	10.61
Everett	5.19	3.37	4.89	3.49	3.83	5.43
Isle of Grain	6.99	5.01	6.44	4.92	5.53	6.46
Lake Charles	2.55	1.00	2.36	1.14	1.27	3.04
Sodegaura	5.40	9.09	5.67	8.83	8.20	4.89
Zeebrugge	9.58	6.25	8.78	6.16	7.16	8.86

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	12,223	63,029	39,123	9,140	55,312	12,961	3,097
PADD 2	82,189	50,550	19,018	7,275	33,679	1,165	15,962
PADD 3	169,053	71,823	39,469	12,048	39,498	16,462	30,427
PADD 4	13,692	6,468	1,927	416	2,837	303	[1]1,639
PADD 5	55,506	28,110	23,235	9,550	13,631	5,166	—
Jan. 16, 2009	**332,663**	**219,980**	**122,772**	**38,429**	**144,957**	**36,057**	**51,125**
Jan. 9, 2009	**326,563**	**213,505**	**117,312**	**37,973**	**144,167**	**34,742**	**53,742**
Jan 18, 2008[2]	**289,397**	**220,341**	**109,278**	**39,752**	**128,543**	**38,540**	**45,425**

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

Refinery report—Jan. 16, 2009

District	REFINERY OPERATIONS		REFINERY OUTPUT				
	Gross inputs	Crude oil inputs	Total motor gasoline	Jet fuel, kerosine	Fuel oils: Distillate	Fuel oils: Residual	Propane-propylene
	1,000 b/d						
PADD 1	1,358	1,354	2,145	83	399	95	72
PADD 2	3,105	3,068	2,089	223	913	32	176
PADD 3	7,021	6,745	2,759	651	2,108	273	604
PADD 4	534	537	319	29	191	11	[1]195
PADD 5	2,652	2,441	1,417	375	542	139	—
Jan. 16, 2009	**14,670**	**14,145**	**8,729**	**1,361**	**4,153**	**550**	**1,047**
Jan. 9, 2009	**15,018**	**14,586**	**8,813**	**1,468**	**4,666**	**550**	**994**
Jan. 18, 2008[2]	**15,082**	**14,920**	**8,965**	**1,448**	**4,104**	**707**	**1,072**
	17,621 Operable capacity		**83.3% 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

	*1-23-09	*1-25-08	Change	Change, %
	$/bbl			
SPOT PRICES				
Product value	53.53	98.24	–44.71	–45.5
Brent crude	43.26	90.05	–46.80	–52.0
Crack spread	10.28	8.19	2.09	25.5
FUTURES MARKET PRICES				
One month				
Product value	52.11	99.08	–46.96	–47.4
Light sweet crude	43.11	89.24	–46.13	–51.7
Crack spread	9.01	9.84	–0.83	–8.4
Six month				
Product value	57.98	101.67	–43.69	–43.0
Light sweet crude	51.22	87.53	–36.31	–41.5
Crack spread	6.76	14.14	–7.38	–52.2

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

OGJ GASOLINE PRICES

	Price ex tax 1-21-09	Pump price* 1-21-09	Pump price 1-23-08
	¢/gal		
(Approx. prices for self-service unleaded gasoline)			
Atlanta	129.2	175.7	311.7
Baltimore	129.8	171.7	309.6
Boston	134.8	176.7	312.6
Buffalo	116.8	177.7	321.6
Miami	128.2	179.8	319.7
Newark	134.2	166.8	308.5
New York	125.8	186.7	311.6
Norfolk	128.4	166.8	315.5
Philadelphia	135.0	185.7	308.7
Pittsburgh	139.9	190.6	311.6
Wash., DC	157.1	195.5	309.6
PAD I avg	132.6	179.4	312.8
Chicago	146.0	210.4	345.4
Cleveland	150.8	197.2	303.7
Des Moines	147.2	187.6	300.6
Detroit	136.1	195.5	302.5
Indianapolis	135.1	194.5	303.7
Kansas City	145.6	181.6	291.6
Louisville	146.7	187.6	300.6
Memphis	140.5	180.3	301.6
Milwaukee	141.2	192.5	303.6
Minn.-St. Paul	141.6	185.6	300.6
Oklahoma City	133.4	168.8	278.0
Omaha	135.7	181.0	288.3
St. Louis	144.6	180.6	300.6
Tulsa	137.5	172.9	294.3
Wichita	135.3	178.7	288.7
PAD II avg	141.2	186.3	300.3
Albuquerque	137.4	173.8	298.7
Birmingham	132.4	171.7	291.7
Dallas-Fort Worth	135.2	173.6	286.7
Houston	128.1	166.5	287.7
Little Rock	135.2	175.4	291.7
New Orleans	133.3	171.7	300.7
San Antonio	131.2	169.6	289.6
PAD III avg	133.3	171.8	292.4
Cheyenne	117.4	149.8	284.7
Denver	125.5	165.9	295.8
Salt Lake City	121.5	164.4	292.3
PAD IV avg	121.5	160.0	290.9
Los Angeles	131.3	198.4	330.8
Phoenix	140.6	178.0	291.3
Portland	160.1	203.5	312.3
San Diego	142.3	209.4	336.2
San Francisco	146.2	213.3	351.2
Seattle	145.5	201.4	319.2
PAD V avg	144.3	200.7	323.5
Week's avg.	**136.7**	**182.3**	**304.9**
Dec. avg.	**125.5**	**171.1**	**300.6**
Nov. avg.	**169.9**	**215.5**	**307.6**
2009 to date	**129.5**	**175.1**	—
2008 to date	**261.9**	**305.5**	—

*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

	1-16-09 ¢/gal		1-16-09 ¢/gal
Spot market product prices			
Motor gasoline (Conventional-regular)		Heating oil No. 2	
New York Harbor	116.59	New York Harbor	146.10
Gulf Coast	118.59	Gulf Coast	138.35
Los Angeles	125.09	Gas oil	
Amsterdam-Rotterdam-Antwerp (ARA)	108.35	ARA	144.01
Singapore	135.17	Singapore	141.67
Motor gasoline (Reformulated-regular)		Residual fuel oil	
New York Harbor	114.84	New York Harbor	90.40
Gulf Coast	111.96	Gulf Coast	113.40
Los Angeles	131.09	Los Angeles	118.73
		ARA	86.24
		Singapore	97.03

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

BAKER HUGHES RIG COUNT

	1-23-09	1-25-08
Alabama	4	3
Alaska	14	7
Arkansas	49	46
California	30	37
Land	29	36
Offshore	1	1
Colorado	77	102
Florida	1	0
Illinois	0	0
Indiana	3	1
Kansas	17	13
Kentucky	12	9
Louisiana	174	148
N. Land	90	53
S. Inland waters	8	21
S. Land	23	26
Offshore	53	48
Maryland	0	1
Michigan	0	1
Mississippi	14	10
Montana	4	12
Nebraska	0	0
New Mexico	55	71
New York	2	4
North Dakota	66	49
Ohio	8	11
Oklahoma	149	195
Pennsylvania	26	18
South Dakota	0	1
Texas	683	851
Offshore	5	8
Inland waters	0	5
Dist. 1	10	16
Dist. 2	33	30
Dist. 3	53	66
Dist. 4	60	86
Dist. 5	139	187
Dist. 6	113	122
Dist. 7B	17	30
Dist. 7C	47	46
Dist. 8	86	128
Dist. 8A	24	18
Dist. 9	41	38
Dist. 10	55	71
Utah	26	39
West Virginia	26	32
Wyoming	59	74
Others—NV-6; TN-4; VA-4; WA-2	16	12
Total US	**1,515**	**1,747**
Total Canada	**426**	**582**
Grand total	**1,941**	**2,329**
Oil rigs	318	318
Gas rigs	1,185	1,422
Total offshore	65	57
Total cum. avg. YTD	**1,623**	**1,749**

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	1-23-09 Percent footage*	Rig count	1-25-08 Percent footage*
0-2,500	68	—	62	4.8
2,501-5,000	70	51.4	100	50.0
5,001-7,500	201	25.3	229	26.6
7,501-10,000	344	2.0	425	2.1
10,001-12,500	301	2.6	427	4.2
12,501-15,000	304	0.3	310	0.3
15,001-17,500	149	—	102	—
17,501-20,000	67	—	71	—
20,001-over	43	—	32	—
Total	**1,547**	**6.6**	**1,758**	**8.0**
INLAND	19		37	
LAND	1,475		1,670	
OFFSHORE	53		51	

*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]1-23-09	[2]1-25-08
	1,000 b/d	
(Crude oil and lease condensate)		
Alabama	20	21
Alaska	715	711
California	651	648
Colorado	62	65
Florida	6	6
Illinois	27	26
Kansas	100	109
Louisiana	1,160	1,259
Michigan	15	15
Mississippi	61	58
Montana	95	87
New Mexico	166	162
North Dakota	177	135
Oklahoma	173	171
Texas	1,320	1,322
Utah	53	53
Wyoming	151	149
All others	66	70
Total	**5,018**	**5,067**

[1]OGJ estimate. [2]Revised.

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

US CRUDE PRICES

	1-23-09 $/bbl*
Alaska-North Slope 27°	49.32
South Louisiana Sweet	44.50
California Midway Sunset 13°	33.20
Lost Hills 30°	42.10
Wyoming Sweet	31.97
East Texas Sweet	42.50
West Texas Sour 34°	35.25
West Texas Intermediate	43.00
Oklahoma Sweet	43.00
Texas Upper Gulf Coast	37.00
Michigan Sour	36.00
Kansas Common	41.75
North Dakota Sweet	27.00

*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]	1-16-09
United Kingdom-Brent 38°	42.37
Russia-Urals 32°	41.94
Saudi Light 34°	38.54
Dubai Fateh 32°	44.34
Algeria Saharan 44°	44.04
Nigeria-Bonny Light 37°	46.24
Indonesia-Minas 34°	45.28
Venezuela-Tia Juana Light 31°	38.03
Mexico-Isthmus 33°	37.92
OPEC basket	42.24
Total OPEC[2]	41.21
Total non-OPEC[2]	40.69
Total world[2]	40.98
US imports[3]	38.24

[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]

	1-16-09	1-9-09	1-16-08	Change, %
	bcf			
Producing region	856	899	823	4.0
Consuming region east	1,343	1,468	1,425	–5.8
Consuming region west	361	369	332	8.7
Total US	**2,560**	**2,736**	**2,580**	**–0.8**
	Oct. 08	**Oct. 07**	**Change, %**	
Total US[2]	**3,399**	**3,567**	**–4.7**	

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

PACE REFINING MARGINS

	Nov. 2008	Dec. 2008	Jan. 2009	Jan. 2008	Change	Change,%
	$/bbl					
US Gulf Coast						
West Texas Sour	9.81	6.80	12.00	9.48	2.52	26.6
Composite US Gulf Refinery	7.57	8.90	13.19	9.95	3.24	32.6
Arabian Light	5.42	6.47	11.36	10.04	1.32	13.1
Bonny Light	1.23	–2.27	3.13	1.81	1.32	72.6
US PADD II						
Chicago (WTI)	1.29	2.73	10.80	5.32	5.48	103.1
US East Coast						
NY Harbor (Arab Med)	6.43	9.11	17.79	10.82	6.97	64.4
East Coast Comp–RFG	6.83	5.60	14.80	8.59	6.20	72.2
US West Coast						
Los Angeles (ANS)	5.83	10.02	16.43	6.47	9.96	153.9
NW Europe						
Rotterdam (Brent)	2.56	3.34	3.83	0.43	3.40	784.9
Mediterranean						
Italy (Urals)	4.31	3.49	5.07	2.84	2.23	78.7
Far East						
Singapore (Dubai)	–2.50	–0.29	1.54	3.04	–1.50	–49.3

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

US NATURAL GAS BALANCE
DEMAND/SUPPLY SCOREBOARD

	Oct. 2008	Sept. 2008	Oct. 2007	Oct. 2008–2007 change	Total YTD 2008	Total YTD 2007	YTD 2008–2007 change
	bcf						
DEMAND							
Consumption	1,627	1,458	1,631	–4	18,954	18,833	121
Addition to storage	334	398	334	—	3,032	2,934	98
Exports	69	59	64	5	787	635	152
Canada	38	27	31	7	438	353	85
Mexico	27	27	29	–2	307	241	66
LNG	4	5	4	—	42	41	1
Total demand	**2,030**	**1,915**	**2,029**	**1**	**22,773**	**22,402**	**371**
SUPPLY							
Production (dry gas)	1,714	1,540	1,654	60	17,031	15,926	1,105
Supplemental gas	5	5	4	1	44	52	–8
Storage withdrawal	91	98	76	15	2,501	2,433	68
Imports	310	313	348	–38	3,263	3,870	–607
Canada	279	274	314	–35	2,937	3,100	–163
Mexico	4	7	2	2	28	47	–19
LNG	27	32	32	–5	298	723	–425
Total supply	**2,120**	**1,956**	**2,082**	**38**	**22,839**	**22,281**	**558**

NATURAL GAS IN UNDERGROUND STORAGE

	Oct. 2008	Sept. 2008	Aug. 2008	Oct. 2007	Change
	bcf				
Base gas	4,235	4,231	4,228	4,236	–1
Working gas	3,399	3,163	2,867	3,567	–168
Total gas	**7,634**	**7,394**	**7,095**	**7,803**	**–169**

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

WORLDWIDE NGL PRODUCTION

	Oct. 2008	Sept. 2008	10 month average Production 2008	10 month average Production 2007	Change vs. previous year Volume	Change vs. previous year %
	1,000 b/d					
Brazil	85	89	87	84	3	3.4
Canada	628	615	639	689	–49	–7.2
Mexico	362	357	367	400	–33	–8.3
United States	1,745	1,537	1,804	1,762	42	2.4
Venezuela	200	200	200	200	—	—
Other Western Hemisphere	201	194	195	204	–9	–4.3
Western Hemisphere	**3,221**	**2,992**	**3,292**	**3,339**	**–47**	**–1.4**
Norway	270	165	274	280	–7	–2.4
United Kingdom	181	148	163	139	25	17.7
Other Western Europe	8	10	10	10	–1	–6.1
Western Europe	**460**	**323**	**446**	**429**	**17**	**4.0**
Russia	424	426	422	426	–4	–1.0
Other FSU	150	150	150	160	–10	–6.3
Other Eastern Europe	15	13	15	15	1	3.9
Eastern Europe	**589**	**589**	**587**	**601**	**–14**	**–2.3**
Algeria	363	362	357	341	16	4.8
Egypt	70	70	70	70	—	—
Libya	80	80	80	80	—	—
Other Africa	118	127	128	126	2	1.3
Africa	**631**	**639**	**635**	**617**	**18**	**2.9**
Saudi Arabia	1,440	1,440	1,440	1,440	—	—
United Arab Emirates	250	250	250	250	—	—
Other Middle East	886	886	880	870	10	1.1
Middle East	**2,576**	**2,576**	**2,570**	**2,560**	**10**	**0.4**
Australia	66	67	66	75	–9	–11.8
China	650	650	632	614	19	3.0
India	—	—	—	4	–4	–100.0
Other Asia–Pacific	179	180	179	177	2	1.3
Asia–Pacific	**895**	**897**	**877**	**869**	**8**	**0.9**
TOTAL WORLD	**8,372**	**8,015**	**8,408**	**8,416**	**–8**	**–0.1**

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

OXYGENATES

	Oct. 2008	Sept. 2008	Change	YTD 2008	YTD 2007	Change
	1,000 bbl					
Fuel ethanol						
Production	20,048	19,197	851	179,531	124,899	54,632
Stocks	15,192	15,994	–802	15,192	11,423	3,769
MTBE						
Production	1,539	563	976	14,820	19,290	–4,470
Stocks	762	1,058	–296	762	1,454	–692

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

US HEATING DEGREE–DAYS

	Dec. 2008	Dec. 2007	Normal	2008 % change from normal	Total degree–days July 1 through Dec. 31 2008	Total degree–days July 1 through Dec. 31 2007	Total degree–days July 1 through Dec. 31 Normal	% change from normal
New England	1,048	1,127	1,078	–2.8	2,481	2,373	2,462	0.8
Middle Atlantic	973	976	998	–2.5	2,171	1,940	2,191	–0.9
East North Central	1,218	1,116	1,135	7.3	2,573	2,260	2,472	4.1
West North Central	1,368	1,285	1,248	9.6	2,761	2,533	2,695	2.4
South Atlantic	480	448	555	–13.5	1,105	895	1,083	2.0
East South Central	672	570	715	–6.0	1,449	1,166	1,410	2.8
West South Central	497	447	520	–4.4	887	783	905	–2.0
Mountain	938	979	928	1.1	1,919	1,929	2,147	–10.6
Pacific	624	615	563	10.8	1,094	1,222	1,253	–12.7
US average*	**824**	**790**	**817**	**0.9**	**1,724**	**1,572**	**1,739**	**–0.9**

*Excludes Alaska and Hawaii.
Source: DOE Monthly Energy Review.
Data available in OGJ Online Research Center.

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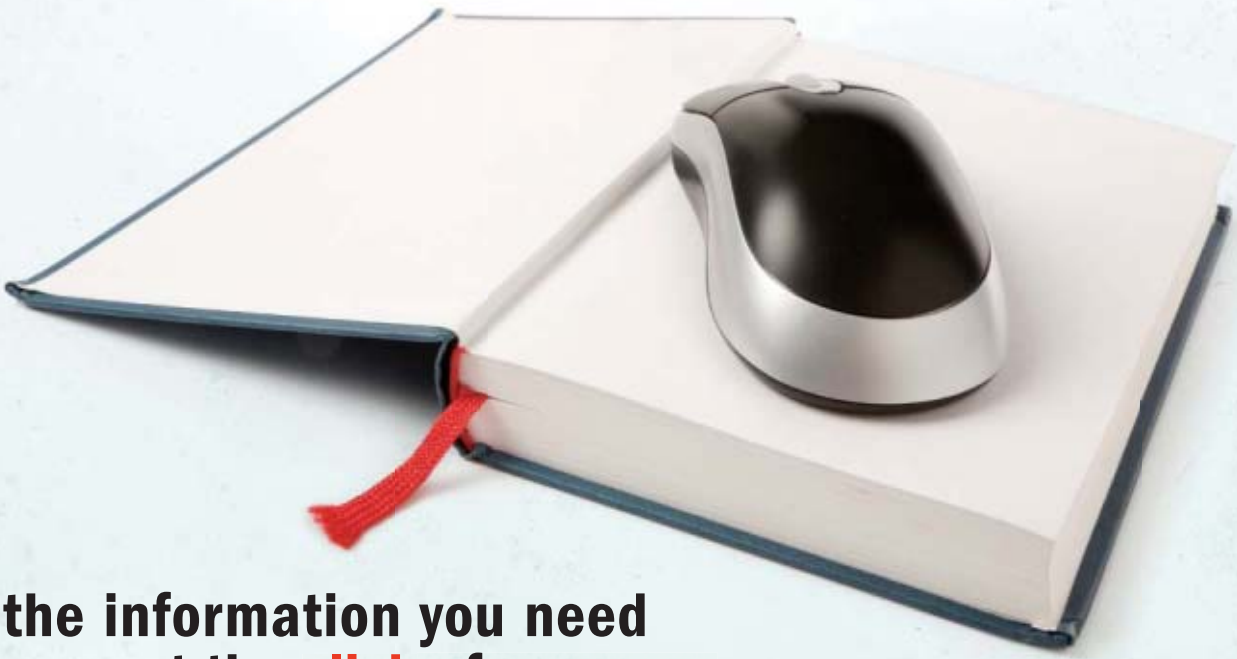

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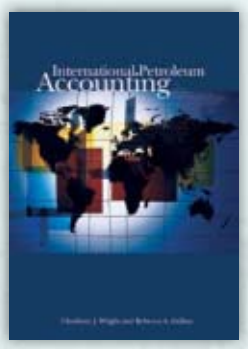

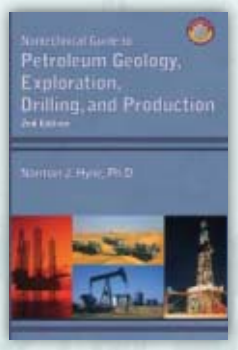

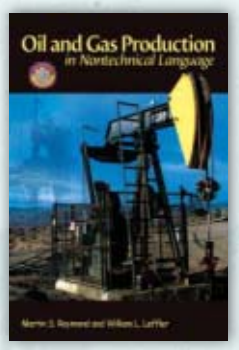

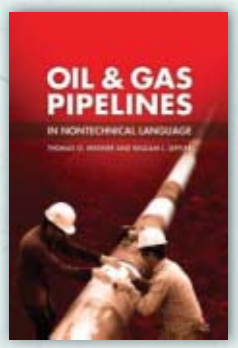

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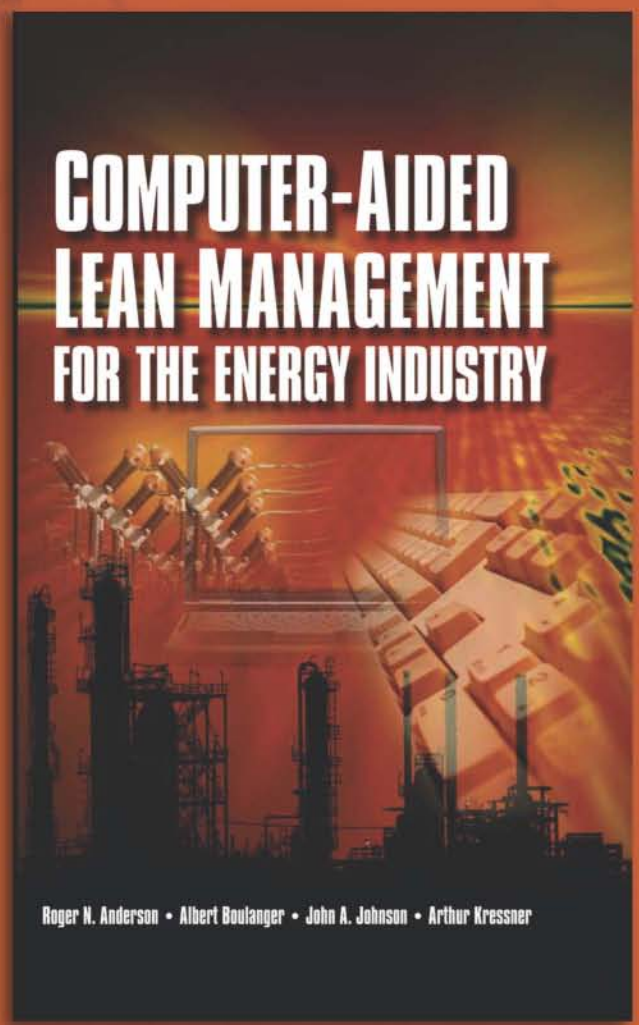

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Plunge refutes US view of what steers oil price

If not for the political damage, uninformed bellyaching about oil prices would be amusing.

In the US, where it's shrill, the complaining started after Hurricanes Katrina and Rita whacked Gulf Coast refining and production in 2005.

Oil prices already were rising in a tightening market. They had no way to respond to the supply shock except to jump.

The Editor's Perspective

by Bob Tippee, Editor

But an altogether transparent and reasonable market response made Americans irrational. When the profits of oil and gas companies subsequently rose, as they inevitably would under the circumstances, anger gave way to consummate rage.

The political consequences remain painfully in memory: the threats of "windfall profit" taxes, the congressional inquisitions of oil company executives, and the nearly total dismissal of the oil and gas industry from pubic acceptability.

While businesses don't have to be popular to succeed commercially, they do need some measure of credibility if they're to have political influence, even if that influence amounts to little more than defense against worst cases.

An oil market characterized by growth that couldn't last and prices unsustainably high quickly has reversed course. To this turn of events, American thinking on the price of oil has no way to respond.

If the oil industry deserved the public hatred it experienced when prices were high, does it now merit love and kisses?

If the elevation of profit by commodity producers in a time of rising commodity prices really amounts to evidence of chicanery, should shrinkage of profit as prices slide not earn for the oil industry cheers from lawmakers and adoration from news commentators?

This, of course, is a facetious game of logic based on a discussion in which, historically, logic has lacked influence. If the past predicts the future, the oil prices that attracted such scorn while high will lose nearly all attention while low.

Before public oblivion takes over, the industry might usefully call attention to another question that more seriously addresses a misunderstanding central to its political difficulties:

If oil companies really possessed the control so frequently ascribed to them, why would they allow oil prices to fall so dramatically now?

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

Market Journal

by Sam Fletcher, Senior Writer

Oil, gas targeted for more taxes

There are "ample signs" that the US states and federal government will take a bigger tax bite from both upstream and downstream oil and gas operations to cover pending financial shortfalls in 2009, warned analysts at Friedman, Billings, Ramsey & Co. Inc. (FBR) in Arlington, Va.

"All over the world, cash-strapped governments looking for ways to shore up shortfalls look to petroleum industry cash flows as a potential source of operating funds. Generally speaking, resource-exporting countries (or US states) consider 'windfall' taxation of the upstream (because that's where the money is), while net importers of crude and petroleum products look at the downstream," FBR analysts said. There's talk California Gov. Arnold Schwarzenegger (R) may consider a severance (extraction) tax and a gasoline tax to help cover his state's "grievous" budget deficit and "precipitously declining" stabilization fund. FBR analysts said, "Our industry sources are skeptical that the governor might cut off the head and feet of the Golden State's golden goose (California is home to 4 of the nation's 10 most-productive oil fields), but our California sources see growing support for tax hikes somewhere in the value chain."

On Feb. 2 when President Barack Obama delivers his first budget request to Congress, "he will set in motion a two-stage process for modifying mandatory federal spending: a budget 'resolution' or outline, followed by 'reconciliation' of federal laws with these spending targets," the analysts said. "Because this process requires only 51 votes (budget bills cannot be filibustered), it presents House and Senate tax-writing committees with a powerful mechanism for stripping oil industry tax benefits."

Likely changes, they said, include:

- Shifting inventory accounting from "last in, first out" to "first in, first out."
- Rescinding Section 199 deductions under the 2004 Jobs bill (an effective 2% tax hike).
- Assessing a new 13% surcharge on Gulf of Mexico deepwater production and deducting existing royalties—"a 0.5% hike for leases with royalty relief phase outs, but a 13% haircut for producers with 'flawed' leases sold in 1998 and 1999," said FBR analysts.
- Treating as US corporations those companies that "inverted" their domicile prior to March 2003, "the current safe harbor date."
- Potentially revisiting tax treatment of intangible drilling costs and geological and geophysical expensing for at least some companies.

FBR analysts predict, "Any new tax changes could [further reduce] gasoline demand given the fragility of the US consumer." Moreover, Diana DeGette (D-Colo.), vice-chairman of the Energy and Commerce committee, "shares Chairman Henry Waxman's (D-Calif.) distaste for hydraulic fracturing, raising odds that 2009 will kick off what we estimate to be a 2-year countdown to higher extraction costs," said FBR analysts. But although fraccing "is in the cross hairs," they said, "the time frame for actual change in standards governing effluent could be more than 2 years away (6 to 12 months to pass a new law and 12 to 18 months to write a new regulation)."

Economy over environment

Strengthening the nation's economy and improving the job market are the top two priorities among US adults while environmental concerns have fallen steeply, according to an annual January poll by the independent Pew Research Center for People and the Press in Washington, DC. "The share of Americans saying that strengthening the nation's economy should be a top priority has risen from 68% 2 years ago to 75% last January to 85% today. Concern about jobs has risen even more sharply. The 82% who rate improving the job situation as a top priority represents a 21-point jump from 61% a year ago," said researchers.

Energy is in sixth place—below terrorism, social security, and education—as a top priority among 60% of those polled, up from 40% in 2003. Protecting the environment fell "the most precipitously" to 41% this year, down from 56% in January 2008, said Pew Research officials. The decline in environment concerns crossed partisan and demographic lines primarily because of growing public concern about the economy, they said. More respondents were concerned with reducing the national deficit (53%) and tax cuts (43%) than with the environment.

The center reported a partisan gap over reducing middle-class taxes. "At the start of 2008, roughly half of both Democrats (50%) and Republicans (46%) rated this as a top priority. Today, just 31% of Republicans say middle class tax cuts are a top priority, compared with 48% of Democrats," they said.

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

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Call for Abstracts

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In 2010, the Deep Offshore Technology International Conference & Exhibition (DOT) returns to Houston, Texas, February 2 – 4 with speaking opportunities for industry-leading solutions providers and operating companies.

Make plans now to share your company's solutions, innovations, and new technology with your industry colleagues.

Please see the accompanying directions for submitting abstracts and send us your presentation ideas. The best and brightest of the industry will be gathering in Houston, February 2 – 4, 2010, for this one-of-a-kind deepwater technology event. Plan now to be there with them.

Abstract Submittal
Deadline: May 15, 2009

Abstracts must have a title and list all authors. Full contact information for the primary contact author (company affiliation, telephone, fax number and email address) must be provided. Please designate which author will be the speaker. Presentations must be of interest and of practical value to executives, managers, engineers, and geologists and geophysicists engaged in the petroleum industry. Papers will be selected based on a review of abstracts by the Program Committee. Papers must not be commercial in nature.

Please submit a 150-400 word abstract around one or more of the technical focus areas by May 15, 2009.

» You may submit your abstract on line at: www.dotinternational.net

Your abstract should address relevant topics pertaining to one or more of the following technical areas:

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DOT XVIII Call for Presentation Abstracts
Information for Authors

1. Final selection of papers will be determined by the DOT Conference Advisory Board. Papers will be evaluated on the basis of abstract submitted. The papers should be in English, completely original, and address deepwater and ultra deepwater issues as outlined in the conference focus areas. Papers and presentations should avoid any commercialism.
2. The following criteria will be observed by the Conference Advisory Board in the selection of papers:
   a. The paper should be of interest for deepwater, ultra deepwater, and/or frontier applications.
   b. The paper should emphasize innovative technologies including an analysis of research.
   c. The paper should address case studies and/or technical interest for indicated topics.
3. Twenty-minutes are programmed to present a paper (presentation in English). A ten-minute discussion will follow each presentation.
4. Authors of papers selected for the DOT program will be notified by the early September 2009.
5. A manuscript and technical presentation will be required for each paper selected. Manuscripts should be provided to DOT with the text on a CD-ROM or by email in MS Word format.
6. Maximum length of paper shall be 15 typewritten pages, including references. Bibliography tables should not exceed 6 pages. Photographs should be sent as black and white prints.
7. Full instructions on preparation of manuscripts and presentations will be sent to authors of selected papers. Complete manuscripts must be provided by mid-November 2009. Slides, sketches, graphs or photographs to illustrate the presentation shall be provided by mid-November 2009.
8. Complimentary conference registration will be provided only for authors who present a paper (1 author per paper). DOT assumes no obligation for expenses incurred by authors for travel, lodging, food, or other expenses.
9. Recognizing the importance of attracting young talent to the industry, DOT has established the George Murray Award for Best Presentation by a Young Engineer (aged 35 or younger). The future of this industry depends on attracting bright, new talent. Innovative thinking by younger engineers should therefore be recognized and rewarded accordingly. To this end, the DOT offers discounted registration fees for attendees, under the age of 35, as well as first time attendees and encourage them to submit technical abstracts for consideration.

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