

Energy (Oil & Gas)  
Asia, Latin America,  
Russia and CIS  
Special Report

# Emerging Markets Oil and Gas

## State-Owned Banks and China Step Up to Fund Sector

### Analysts

Jose Luis Villanueva, CFA  
+1 212 908-9158  
[joseluis.villanueva@fitchratings.com](mailto:joseluis.villanueva@fitchratings.com)

Simon Wong  
+65 6796-7235  
[simon.wong@fitchratings.com](mailto:simon.wong@fitchratings.com)

Jeffrey Woodruff, CFA, FRM  
+44 207 682-7322  
[jeffrey.woodruff@fitchratings.com](mailto:jeffrey.woodruff@fitchratings.com)

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The emerging markets (EM) oil and gas industry is dominated primarily by national oil companies (NOC), which control more than two-thirds of both production and proved hydrocarbon reserves in the world. In 2009, these state-owned companies are experiencing a significant decline in cash flow generation driven primarily by a lower price environment at the time that they need to fund aggressive capital investment plans (initiated over past years of historical high oil prices) during a tight credit market and constrained government budgets. This report is largely focused on companies with an upstream bias, particularly in Fitch's rated universe in EM.

Fitch expects NOCs to limit the deterioration in their credit metrics by revising down capex budgets and to access alternative sources of financing to meet liquidity needs. These include funds from China, government banks and international oil companies (IOCs). NOCs in EM have already secured about USD45 billion from China in return for access to their hydrocarbons. Government banks in Brazil and Russia have committed to funding a significant portion of their respective NOCs refinancing needs. State-owned banks and China are expected to fund approximately USD60 billion to sector companies rated by Fitch, representing 55% of their USD108 billion funding needs in 2009.

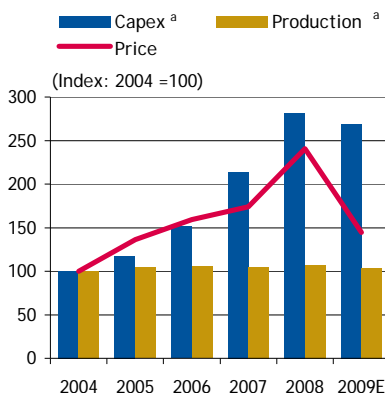
IOCs are increasingly interested in partnering with NOCs as their healthy balance sheets, technical expertise and mature oil fields drive them to trade their capital and know-how for a stake in promising oil basins. However, Fitch expects the incremental participation of IOCs in EM to be marginal as EM sovereigns see oil and gas as strategic assets for national security, economic and political reasons. In addition, IOCs have been more carefully deploying capital overseas after expropriations in Venezuela and coerced sales in Russia over the past few years, as well as unfriendly upstream profit tax regimes rendering production uneconomical.

Fitch anticipates most negative rating actions in 2009 to be triggered by sovereign downgrades. The key risks for the stability of the ratings of EM oil and gas companies are the impact of the global recession on the EM sovereigns and the balanced use of debt during the current lower hydrocarbon price environment. Oil and gas companies' ratings in EM are closely correlated with those of the sovereign, as governments often control the operations of the companies, dictate the energy policies that regulate them and set national price policies. NOCs generate significant revenues for the sovereign and hard currency that helps to balance external accounts.

### Capital Expenditures to Decline in 2009

Capital expenditure cuts could exacerbate production declines, particularly in Russia and Mexico. Despite the high correlation of capex in EM to oil price levels, production declined in these countries, and further declines could be forthcoming if exploration and production (E&P) budgets are cut. It takes about three years from discovery to production of an on-shore field in normal markets conditions, but given the significant decline in oil prices, most companies have decreased investment plans for 2009. Others are likely to do so as the year progresses if crude prices remain relatively low, resulting in longer times to production for newly discovered fields.

**Capex Correlation With Oil Prices**



<sup>a</sup>Capex and production indexes include Pemex, PDVSA, Petrobras, Ecopetrol, Lukoil, Rosneft, TNK-BP, Gazprom Neft, KazMunaiGas E&P, PetroChina, Sinopec, CNOOC, Petronas, PTT.

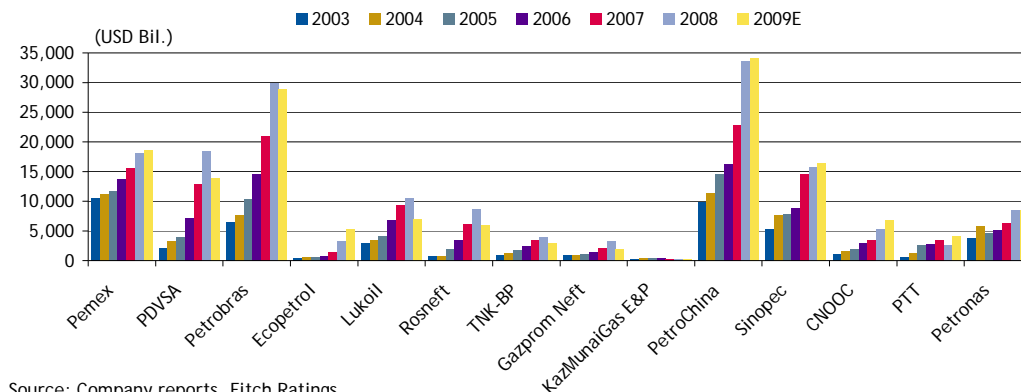
Source: Company reports, Fitch Ratings.

The primary capex areas to be affected include long-range exploration projects; development of high-cost, non-conventional fields; the pace of development spending at existing fields; downstream refurbishments; and marketing/sale plan enhancements. International investments are also particularly vulnerable as NOCs focus on spending in their own countries (except China and Malaysia, which continue to expand investments abroad) to contribute to the countercyclical policies of their respective sovereign. For example, Russian NOCs have reduced total capex by 30%–40% compared to 2008, while Chinese NOCs have reduced E&P capex on average by only 6%. Latin American NOCs seem to be more aggressive in terms of investment plans as 2009 budgets have not been cut yet, except at PDVSA in Venezuela from USD24 billion to USD17 billion.

The capital expenditure for Fitch's EM oil and gas rated universe is not expected to fall at the same rate as oil prices due to the difficulty of cutting projects already in development as well as the capex increases at some entities such as Ecopetrol and PTT. These companies plan to increase capex by USD2 billion and USD1.5 billion, respectively, given their aggressive production targets, good investment prospects and strong liquidity. Chinese NOCs are expected to increase M&A in the non-E&P segment, as they try to secure downstream assets abroad and diversify its refining capacity.

In real terms, investment declines are expected to be less severe as oil field service prices go down in line with oil prices and lower capacity utilization of equipment allows NOCs to negotiate lower fees with suppliers. This in turn should alleviate some of the cost pressures accumulated over the past few years, increase capex efficiency and partially offset pressure on margins. Another factor that could have a positive impact on margins and capex burdens is the devaluation of EM currencies (except the Chinese yuan), which, for entities that buy domestic materials and services in local currency, will reduce investment budgets in dollar terms. This will also impact labor-related costs including pensions and other post-employment benefits (OPEB), which are both denominated in local currency, whilst translating dollar revenues at devalued exchange rates boosts income. These costs comprise a large proportion of cash outflows from operations for most EM oil and gas companies, and in the case of capitalized costs (including underfunded pensions and OPEB) will also be reflected in balance-sheet liabilities, which will be lower.

**Capex  
(2003–2009)**



Source: Company reports, Fitch Ratings.

## China and State-Owned Banks to Play a Key Role in the Financing of the Sector

In recent years, China's oil and gas companies have been searching globally for resources to secure future energy supply. However, their success has been constrained by various barriers and protectionism measures, rendering outright acquisition of energy companies an uphill task. The global credit crunch and a low oil price environment have created a unique opportunity for China to enhance its long-term energy security as well as improving its ties with oil-rich countries and their NOCs.

China has been less affected than other countries by the recent global credit crunch due to its continuing economic growth (albeit at a slower pace), strong international reserves of USD2.13 trillion as well as supportive monetary and fiscal policies. China is the world's second largest oil consumer, representing nearly 10% of the total worldwide oil consumption of 85 million barrels per day (bpd), of which it imported approximately 51.3% of its oil needs during 2008 (50.5% in 2007). Due to China's reliance on imports, Fitch expects China to continue to look for opportunities to secure new oil and gas resources to support its growing energy needs. For example, Sinopec Group's recently acquired Addax Petroleum Corp. for USD7.4 billion, which gave China access to upstream assets in Nigeria, Gabon and potentially Iraq.

Since February 2009, China has signed a series of 'Loan for Oil' agreements, providing about USD45 billion in loans to NOCs in exchange for up to 650,000 bpd of crude oil (or 18% of China's imports in 2008). These loans include USD25 billion to Russian NOCs (Transneft and Rosneft), USD10 billion to Petrobras, USD5 billion to National Company KazMunaiGas (NC KMG), USD4 billion to Venezuela (PDVSA) and USD1 billion to Angola. These schemes have been made possible by the strong backing of China's policy banks (China Development Bank [CDB, 'A+' /Stable] and Export-Import Bank of China [China Exim]), which have strong support in the domestic debt market, aided further by the easing of monetary policy by China's central bank — all ultimately a result of Chinese government support for the sector.

Other EM governments are also providing liquidity to NOCs through state-owned banks or bi-lateral intergovernmental agreements during the current tight credit markets.

### China's Loans to Oil and Gas Companies in Emerging Markets

Announcement Date	Country	Loan Amount (USD Bil.)	Detail of Scheme <sup>a</sup>
February 2009	Russia	25	OJSC OC Rosneft and OAO Transneft to supply 300,000 bpd from 2011 until 2030, via a new pipeline link to be completed by 2010 (loan extended by CDB at 6% interest rate).
February 2009	Brazil	10	Petrobras to supply 150,000 bpd to Sinopec in 2009 and 200,000 bpd from 2010 to 2019 at market price (loan extended by CDB with a 6.5% interest rate).
February 2009	Venezuela	4	PDVSA to supply 200,000 bpd to China for 20 years, estimated to commence in 2013 (loan extended by CDB to Banes, Venezuela's Development Bank).
April 2009	Kazakhstan	5	Comprised of a USD5 billion loan extended to KazMunaiGas by PetroChina's parent, CNPC. In addition, China Exim also extended USD5 billion loan to Kazakhstan Development Bank. In return, CNPC and PetroChina were allowed to acquire a 50% stake in MangistauMunaiGas, jointly with KazMunaiGas.

<sup>a</sup>These schemes are welcomed by the NOCs, which retain ownership and control of their upstream assets while gaining the much needed liquidity to fund their capex programs during a period when government budgets are significantly tightened and other sources of capital are constrained. Source: Fitch Ratings.

## Expected Funding Sources in 2009<sup>a</sup>

(USD Bil.)

	Pemex 'BBB' Stable	PDVSA 'B+' Stable	Petrobras 'BBB' Stable	Ecopetrol 'BB+' Stable	Lukoil 'BBB-' Stable	Rosneft 'BBB-' Neg.	TNK-BP 'BBB-' Neg.	KMG E&P 'BBB-' Neg.	PetroChina 'A+' Stable	Sinopec 'A-' Stable	CNOOC 'A' Stable	PTT 'BBB' Stable	Petronas 'A' Stable	Total	%
Government Banks	—	—	12.5	—	5.0	3.0	—	—	6.6	5.0	3.5	—	—	35.6	33
China Development Bank	—	4.0 <sup>b</sup>	10.0	—	—	10.0	—	—	—	—	—	—	—	24.0	22
Exim Institutions	1.8	2.0	2.5	—	—	—	—	—	—	—	—	—	—	6.3	6
Domestic Capital Markets	2.5	3.0	—	—	0.8	—	—	—	6.6	—	—	2.6	—	15.5	14
International Capital Markets	2.5	—	2.8	1.5	1.0	—	1.0	—	—	—	—	—	4.5	13.3	12
Other	2.3	—	2.5	1.5	1.2	—	0.6	—	—	5.0	—	—	—	13.1	12
<b>Total</b>	<b>9.0</b>	<b>9.0</b>	<b>30.3</b>	<b>3.0</b>	<b>8.0</b>	<b>13.0</b>	<b>1.6</b>	<b>0.0</b>	<b>13.2</b>	<b>10.0</b>	<b>3.5</b>	<b>2.6</b>	<b>4.5</b>	<b>106.7</b>	<b>100</b>

<sup>a</sup>Expected funding sources include incremental debt and refinancing. <sup>b</sup>PDVSA funding sources includes a USD4 billion loan granted by CDB to Bndes (Venezuela's Development Bank), which in turn grants loans to PDVSA.

Source: Fitch Ratings and company reports.

VTB, Sberbank, Gazprombank and VEB are the main banks undertaking refinancing in Russia, while BNDES is providing most of the refinancing needs for Brazilian oil and gas companies.

In Russia, government measures to secure the financial stability of the oil companies have led to the major state-owned banks refinancing approximately USD5.0 billion for LUKOIL and USD3.0 billion for Rosneft in 2009. Additionally, Rosneft finalized its USD15 billion, 20-year loan from China Development Bank in May 2009, which was negotiated on behalf of the company by the Russian government with two tranches to be delivered in 2009 and 2010. In Kazakhstan, NC KMG has entered partnerships with CNPC to fund key oil and gas transportation infrastructure projects, with Kazakh government backing.

BNDES, the development bank in Brazil, has committed to provide Petrobras USD12.5 billion and USD10 billion in financing for 2009 and 2010, respectively, which represents about 50% of the company's funding needs in the next two years. These funds together with the USD10 billion, 10-year loan provided by CDB cover most of the financing requirements for the same period. Indirectly through government banks, PDVSA also received a loan from the CDB of USD4 billion in exchange for 200 thousand barrels per day (mbpd) starting in 2013, strengthening the relationship of China and Venezuela, which have signed energy and technology cooperation agreements and set up a fund to finance multiple sectors. Mexico's Pemex will be using \$1 billion funds from the national economic stabilization fund to build a refinery, the first in the last 30 years.

Most NOCs still have access to the international markets highlighted by the Pemex, Petrobras and Gazprom issuances earlier this year of USD2 billion, USD2.75 billion and equivalent USD5.2 billion, respectively. Recently Ecopetrol issued USD1.5 billion and Petronas issued USD4.5 billion while LUKOIL and TNK-BP are likely to issue later in 2009. Chinese NOCs rely primarily on local financial institutions and capital markets to meet their financing needs and NOCs from other countries have been successful accessing the domestic markets.

Fitch notes that Chinese oil and gas companies have continued to have access to capital during the global credit crunch and that local financial institutions and capital markets have been very supportive of their growing financing needs. In the first quarter of 2009, PetroChina successfully issued CNY30 billion (USD4.4 billion) of three-year unsecured

notes, followed by a further CNY15 billion (USD2.2 billion), five-year unsecured note in May 2009. In addition, China has set aside USD18 billion and USD35 billion for the domestic oil and gas upstream sector and downstream sector, respectively, part of the overall USD585 billion stimulus package announced in November 2008 to support the economy amid the global recession.

### **Lower Oil Prices Not Likely to End Resource Nationalism**

Lower hydrocarbon prices are unlikely to end resource nationalism. Whilst EM NOCs need to attract the development capital to meet their production and reserve targets, they also need the technological expertise of IOCs. However, most countries see the control of their oil and gas assets as part of their sovereignty as well as a source of political and economic power, with IOCs only obtaining minority stakes in new fields and NOCs preferring to pay for IOCs technical expertise through operating contracts. Hydrocarbon related revenues in the form of royalties, taxes, dividends and other contributions to the government represent close to 50% of government revenues for Venezuela and Malaysia, about 35% for Mexico, Russia and Kazakhstan, and less than 20% for China, India, Thailand and Brazil. Regardless of how significant oil and gas related revenues are for the sovereign, the control of these resources is increasingly seen as a source of energy independence and national pride.

With higher oil prices resource nationalism was exacerbated resulting in governments limiting the upside for producers via higher taxes, renegotiations of long-term contracts, and nationalization or coerced sales in Venezuela, Bolivia, Russia and Kazakhstan. Due to increasing political interferences, IOCs are currently more cautious in investing overseas, and legal frameworks changes in EM countries are also not encouraging such investments. The result of control and ownership disputes in Russia has reinforced concerns about the effectiveness of the judiciary system. Last year's energy reform in Mexico does not allow private capital investment in upstream and downstream activities due to opposition in Congress; and even in Brazil, the pending regulatory changes are expected to grant the government ownership and control of the new pre-salt discoveries in the Santos basin.

Potential options for IOCs to invest in promising oil basins in EM to diversify their portfolios and replace declining production/reserves at their mature fields include offshore projects in China, product sharing contracts in Malaysia and joint ventures in the Orinoco Belt and Krishna Godavari basins. The risk of a reduction in private capital investment in Mexico, Russia and Kazakhstan for the aforementioned reasons might put the production and reserve targets of these countries at risk. Petronas has recently signed a production sharing contract (PSC) with ExxonMobil to develop seven oil fields in offshore peninsular Malaysia, to enhance oil recovery from mature fields and to sustain the current level of crude production. Meanwhile, in April 2009, CNOOC Limited's (CNOOC) parent China National Offshore Oil Corporation (CNOOC Corp.) invited bids for the oil exploration rights at 17 blocks in China's South China Sea covering a total of 42,021 square kilometers. Investments for oil and gas exploration in South China over the next 10–20 years are expected to be up to USD29 billion (CNY200 billion).

### **Key Rating Drivers in 2009**

Fitch anticipates most rating actions in 2009 for NOCs will be driven by sovereign rating actions. The key risk for the stability of the ratings of EM oil and gas companies is the continued inter-relationship between the entities and their respective sovereign. The impact of the global recession on the EM sovereigns and the balanced use of debt by NOCs during the current low hydrocarbon price environment will also be a key determinant. Oil and gas companies in EM tend to be highly linked to the sovereign as the government controls the operations of the companies, dictates the energy policies



that regulate them and sets price policies which include significant subsidies in Venezuela, China and India. Also, NOCs are strategic for the sovereign since they generate a significant portion of the sovereign's revenues and foreign currency, are generally the largest employers in the country and control the key energy source.

Although EM are in a better position to weather the current crisis than in previous downward cycles, several sovereigns saw their issuer default rating (IDR) negatively impacted by the expected shock of a severe global recession, lower commodity prices, and reduced capital and financial flows. Kazakhstan and Venezuela's IDRs were downgraded and in turn NC KazMunaiGaz and PDVSA's IDRs were downgraded at the end of last year. Russia, Mexico and Kazakhstan remain on Negative Outlook and a downgrade of the sovereign could result in a downgrade of their respective NOC's IDR. Also an extended and sustained time period of oil prices below \$40/barrel combined with higher leverage to finance capital expenditure would put pressure on ratings. Fitch rates companies through the cycle, but a deviation from acceptable long-term credit metric levels could result in a negative rating action. For more information of Fitch's criteria for upstream oil and gas entities see "Oil and Gas E&P Rating Methodology", dated Oct. 16, 2008, at [www.fitchratings.com](http://www.fitchratings.com).

### Linkage to the Sovereign

The EM oil and gas sector is predominantly operated by sovereign owned entities, which seek to control and influence these entities as they generate a substantial portion of the government's revenues, particularly in Venezuela and Malaysia. In many cases, the NOC's ratings are aligned or linked to those of the sovereign, as these companies are

### Sovereign Linkage

Company:	Pemex	PDVSA	Petrobras	Ecopetrol	Lukoil	Rosneft	TNK-BP	Gazprom Neft	KMG E&P	PetroChina	Sinopec	CNOOC	PTT	Petronas
FC IDR:	'BBB'	'B+'	'BBB'	'BB+'	'BBB-'	'BBB-'	'BBB-'	NR	'BBB-'	'A+'	'A-'	'A'	'BBB'	'A'
Outlook:	Stable	Stable	Stable	Stable	Stable	Neg.	Neg.	—	Neg.	Stable	Stable	Stable	Stable	Stable
Country	Mexico	Venezuela	Brazil	Colombia	Russia	Russia	Russia	Russia	Kazakhstan	China	China	China	Thailand	Malaysia
Sovereign Rating and	BBB+	B+	BBB-	BB+	BBB	BBB	BBB	BBB	BBB-	A+	A+	A+	BBB	A-
Sovereign Outlook	Negative	Stable	Stable	Stable	Neg.	Neg.	Neg.	Neg.	Neg.	Stable	Stable	Stable	Stable	Stable
Government Ownership	100	100	40	89.9	0	75	0	75	61	87	76	64	67	100
NOC Debt/Public Sector Debt (%)	13	29	4	NS	NA	15	NA	3	13	2.8	4.2	0.3	12	20
Expected Real GDP Growth (2009/2010) (%)	(5.5)/1.3	(1.3)/(0.4)	(1.0)/3.2	(0.3)/2.6	(3.0)/2.0	(3.0)/2.0	(3.0)/2.0	(3.0)/2.0	(3.5)/1.0	5.6/8.2	5.6/8.2	5.6/8.2	(4.5)/1.3	(4.8)/4.3
Country Net Oil Exports (% of GDP) (%)	2	24	(0.1)	4.5	20.0	20.0	20.0	20.0	30.0	(3.9)	(3.9)	(3.9)	(7.1)	12.4
Royalties and Tax Payments/Government Revenues (%)	38	51	14	19	10 <sup>a</sup>	10 <sup>a</sup>	4 <sup>a</sup>	2 <sup>a</sup>	5 <sup>a</sup>	4	2	1	5	45
Total Contributions to the Government/ Company EBITDA (%)	90	152	81	111	229	225	128	84	47	93	131	55	50	65
Total Contributions to the Government/ Company Revenues (%)	58	42	22	43	10	10	4	2	5	24	8	30	5	31
Total Contributions to the Government	69,127	53,308	25,679	7,385	38,971	38,234	13,505	6,686	1,639	36,889	16,380	5,400	2,243	20,065
Royalties, Production and Extraction Taxes	68,753	27,750	14,683	3,032	34,804	35,943	11,182	5,222	204	12,316	4,740	3,173	496	2,820
Income Tax	374	8,225	9,259	2,227	4,167	1,904	2,323	1,464	1,389	5,080	3,047	2,227	1,141	7,717
Dividends	—	2,000	1,737	2,126	—	387	—	—	—	—	—	—	607	8,905
Other Contributions to the Government	—	15,333	—	—	—	—	—	—	46	19,494	8,594	—	—	623

<sup>a</sup>Government revenues from the entire oil and gas sector in both Russia and Kazakhstan represent approximately 38% of the total. FC IDR – Foreign currency issuer default rating. NR – Not rated. NS – Not significant as the metric represents less than 1%. NA – Not applicable.

Source: Fitch Ratings and company reports.

important to the local economies, representing a significant portion of public sector debt and government income. The same factors that have an impact on the government influence the NOC's ratings such as the price of oil. The level of correlation or alignment between the NOC's rating and that of its parent (the sovereign) is determined by the application of Fitch's parent and subsidiary rating methodology. This methodology focuses on legal, strategic and operational linkage between the entities in determining whether alignment or a level of linkage is appropriate. Most NOC's show strong legal, operational and strategic linkages to their parents; for example Pemex, PDVSA, Rosneft, Gazprom, NC KazMunaiGas, Petrochina and CNOOC's IDRs, are either aligned or one notch below their respective sovereign's IDR. Petrobras and Petronas are rated one notch above the sovereign due to their strong credit profile, significant export revenues and capital base in the case of Petrobras.

Also, the NOC's underlying financial profile is often driven by political influences and energy policies dictated by the government, such as pricing controls and special taxes. Government influence in the operating decisions of NOCs is sometimes mitigated by the ownership diversification, like in the case of Petrobras and Ecopetrol. However, entities which are privately owned, such as LUKOIL and TNK-BP, are not immune to government interference, although this is not considered the primary driver of their ratings. Having a mixed capital structure with partial private sector ownership reduces political intervention and increases the likelihood of more market-oriented policies in the companies. A lower correlation between the public sector entity and the sovereign's IDRs could allow for NOC's ratings to be rated above those of the sovereign, provided Fitch felt enough of the company's revenue generation ability was located outside the jurisdiction of the respective sovereign. This ex-jurisdictional revenue stream may allow for some possible credit enhancement above the sovereign on a case-by-case basis. For more information, please see "Rating Corporates Above the County Ceiling" at [www.fitchratings.com](http://www.fitchratings.com).

### Commodity Prices

Given the decline in commodity prices witnessed during the second half of 2008, the estimated timing, duration and level of a sustained price recovery has become increasingly important when analyzing most energy companies. During the past few years, commodity prices have been significantly above Fitch's long-term expectations, and as a result, most companies were able to generate ample cash flows to maintain reserve and production profiles. As prices have moved lower, "excess" cash flows have dried up, and funds available for investments, shareholders (primarily the government) and deleveraging are limited. However, as long as prices remain at or above USD40/barrel, oil production in EM should remain profitable for the most part. Although unlikely, prices below that level in 2009 and 2010 on a sustained basis would deteriorate margins further and could put

### Summary of Historical Hydrocarbon Prices

	Oil Prices — WTI (\$/bbl)			Natural Gas Prices — Henry Hub (\$/mcf)		
	Avg. Price	Max. Price	Min. Price	Avg. Price	Max. Price	Min. Price
1997	20.58	26.62	17.60	2.48	4.60	1.79
1998	14.38	17.82	10.76	2.08	2.64	1.03
1999	19.30	27.92	11.37	2.27	3.08	1.65
2000	30.37	37.21	23.90	4.30	10.50	2.14
2001	25.96	32.19	17.45	3.96	10.20	1.74
2002	26.17	32.72	17.97	3.37	5.29	1.98
2003	31.06	37.83	25.24	5.49	19.38	3.99
2004	41.51	56.17	32.48	5.90	8.14	4.40
2005	56.59	69.81	42.12	8.89	15.39	5.50
2006	66.09	77.03	55.81	6.73	9.87	3.63
2007	72.23	98.88	50.48	6.97	9.07	5.29
2008	99.92	145.29	31.41	8.89	13.31	5.37
2009 (YTD)	54.37	72.68	33.98	3.99	6.11	3.18

Bbl – Barrel. Mcf – Thousand cubic feet.  
Source: Bloomberg.

pressure on ratings. Moreover, higher cost production and investments in deepwater operations would be discouraged, putting production and reserve targets in the region at risk.

The interaction between supply and demand will ultimately determine the future price of oil. On the supply side, OPEC cuts are unlikely to have a significant impact on prices given the global recession and production capacity additions in the next couple of years. Fitch currently expects that the world economy will experience the trough of a severe recession in 2009, with the major advanced economies (U.S., Euro area, U.K. and Japan) witnessing negative GDP growth of -4.2% in 2009, the steepest decline in GDP since World War II. World GDP is expected to contract by 3.3%, compared with an average growth of 3.5% over the last five years. So the picture is not very compelling for price increases in the short-term despite the fact that they have recently reached \$70/barrel on recovery and inflation expectations. For modeling purposes Fitch currently uses oil prices of USD55/barrel in 2009, USD57.50/barrel in 2010 and USD60/barrel in the long term under a base case scenario. Under a stress case scenario, Fitch currently uses USD40/barrel, USD42.50/barrel and USD45/barrel, respectively.

### Financial and Operating Metrics

Liquidity in the sector remains solid as NOCs improved their maturity profiles over the last few years and most of them continue to have access to the international capital markets. Earlier this year Pemex, Petrobras and Gazprom issued USD2 billion, USD2.75 billion and the equivalent of USD5.2 billion in bonds, respectively, in the international markets. Recently Ecopetrol issued USD1.5 billion and Petronas issued USD4.5 billion, while LUKOIL and TNK-BP might follow in the second half of 2009. Petrobras is expected to finance more than one-third of its debt maturities and its aggressive capex budget with funds from government banks (BNDES). Also, the domestic EM capital markets remain open for the sector. Moreover, as previously mentioned, China will play a key role in funding the financing needs of EM oil and gas entities. China Development Bank (CDB) will lend USD25 billion to Transneft and Rosneft, USD10 billion to Petrobras and USD4 billion to PDVSA (indirectly through Banesco and other government banks/funds). The USD39 billion represents more than 50% of the financing needs for these companies in 2009.

### Liquidity

(USD Mil., As of Dec. 2009)

	Pemex 'BBB' Stable	PDVSA 'B+' Stable	Petrobras 'BBB' Stable	Ecopetrol 'BB+' Stable	Lukoil 'BBB-' Stable	Rosneft 'BBB-' Neg.	TNK-BP 'BBB-' Neg.	Gazprom NR	Neft NR	KMG E&P 'BBB-' Neg.	PetroChina 'A+' Stable	Sinopec 'A-' Stable	CNOOC 'A' Stable	PTT 'BBB' Stable	Petronas 'A' Stable
Cash	8,341	4,483	6,623	940	2,239	3,083	1,745	2,075	4,640	4,825	1,128	6,014	2,635	25,139	
Short-Term Debt	6,661	1,677	5,961	125	3,232	14,084	1,898	2,085	123	13,586	14,424	460	595	2,557	
Cash/Short-Term Debt (x)	1.3	2.7	1.1	NA	0.7	0.2	0.9	1.0	37.6	0.4	0.1	13.1	4.4	9.8	
(EBITDA — Capex)/Short-Term Debt (x)	9.7	9.9	0.3	NA	2.0	0.6	3.5	2.2	23.5	0.5	(0.2)	10.1	3.0	8.8	

NA – Not applicable. NR – Not rated.

Source: Fitch Ratings and company reports.

Despite expected production growth in Brazil, China and Kazakhstan, oil production in EM is expected to fall in 2009 due to production declines in Mexico and Russia as well as cuts in OPEC countries. With the energy reform in Mexico and an aggressive capex plan, PEMEX expects to slowdown the 9% oil production decline experienced in 2008 and reach P1 RRR of 100% by 2012. Fitch believes that Pemex's negative production trends



will be challenging to turn around given the double-digit decline rate in production at Cantarell, Pemex's most important oil field, and that the most promising basin (Chicontepec) depends on drilling about 1,200 wells in a highly populated area.

In Russia the oil sector is currently facing significant challenges as the industry deals with a rapid slowdown in production growth. In 2008, average daily oil production declined by 0.7% compared to growth of around 10% five years earlier. Fitch expects this downward trend to continue in 2009 with average aggregate industry production dropping by 1.0%–1.2%, although some individual companies may experience production growth of 2%–3% in 2009.

Meanwhile, production is also expected to decline in Venezuela in 2009 amid OPEC restrictions, which require the country to reduce production by 364 mbpd. Also, PDVSA's recent nationalization of oil field service companies might exacerbate concerns about government intervention and make it more difficult to attract the needed capital and expertise for Venezuela to reach production levels above the pre-strike levels of 3.3 million barrels per day (mmbpd) in 2001.

Reserve lives in EM are healthy; however, production trends will continue to be a concern in Mexico and Russia. With lower hydrocarbon prices, tight credit markets and higher cost of capital, aggressive capital budgets might be curtailed, putting the growth rates for oil and gas production in our EM oil and gas rated universe at risk.

## Operating Metrics

	Pemex 'BBB' Stable	PDVSA 'B+' Stable	Petrobras 'BBB' Stable	Ecopetrol 'BB+' Stable	Lukoil 'BBB-' Stable	Rosneft 'BBB-' Neg.	TNK-BP 'BBB-' Neg.	Gazprom Neft NR	KMG E&P 'BBB-' Neg.	PetroChina 'A+' Stable	Sinopec 'A-' Stable	CNOOC 'A' Stable	PTT 'BBB' Stable	Petronas 'A' Stable
<b>Upstream Metrics</b>														
E&P Production (000 boepd)	3,965	3,919	2,400	447	2,182	2,112	1,850	641	190	3,237	947	531	248	1,773
Oil	2,792	3,260	1,979	361	1,874	—	—	—	—	2,385	813	422	65	785
Gas	1,173	659	421	87	308	—	—	—	—	852	134	109	182	988
P1 Reserves (Mil. boe)	14,308	202,670	11,129	1,137	19,089	13,360	8,112	3,237	703	21,423	4,001	2,515	944	26,370
Oil	10,445	172,323	9,106	799	14,242	—	—	—	—	11,221	2,841	1,578	201	7,880
Gas	3,863	30,347	2,023	338	4,847	—	—	—	—	10,202	1,160	937	743	18,490
RRR (%)	72	5,261	42	55	(29)	77	82	(309)	61	117	77	60	98	90
Reserve Life or R/P Ratio (Years)	9.9	141.7	12.7	7.0	24.0	17.3	12.0	13.8	10.1	18.1	11.6	13.0	10.4	40.8
Oil	10.2	144.8	12.6	6.1	20.8	—	—	—	—	12.9	9.6	10.2	8.4	27.5
Gas	9.0	126.2	13.2	10.7	43.1	—	—	—	—	32.8	23.7	23.6	11.2	51.3
<b>Downstream Metrics</b>														
Refining Capacity (000 bpd)	1,540	3,035	2,249	335	1,178	1,088	675	530	—	2,800	4,140	—	374	565
Domestic Refineries	6	5	11	4	5	7	4	3	0	26	33	0	5	3
Total Refineries (Domestic and WW)	7	21	16	4	8	7	5	3	0	26	33	0	5	4

BOEPD – Barrels of oil equivalent per day. E&P – Exploration and Production. NR – Not rated. P1 Reserves – Proved reserves. RRR – Reserve replacement ratio. Reserve life or R/P – Reserves over production in years.

Source: Fitch Ratings and company reports.

## Financial Metrics

(USD Mil., As of Dec. 31, 2008)

	Pemex 'BBB' Stable	PDVSA 'B+' Stable	Petrobras 'BBB' Stable	Ecopetrol 'BB+' Stable	Lukoil 'BBB-' Stable	Rosneft 'BBB-' Neg.	TNK-BP 'BBB-' Neg.	Gazprom Neft NR	KMG E&P 'BBB-' Neg.	PetroChina 'A+' Stable	Sinopec 'A-' Stable	CNOOC 'A' Stable	PTT 'BBB' Stable	Petronas 'A' Stable
Revenues	119,044	126,364	118,257	17,225	107,680	68,991	51,886	33,075	5,940	154,671	205,092	18,191	57,287	64,970
EBITDA	76,936	34,967	31,741	6,667	17,042	16,988	10,542	7,965	3,487	39,709	12,514	9,894	4,470	30,990
EBITDA Margin (%)	64.6	27.7	26.8	38.7	15.8	24.6	20.3	24.1	58.7	25.7	6.1	54.4	7.8	47.7
Capex	12,628	18,413	29,874	3,407	10,537	8,732	3,924	3,327	586	33,531	15,597	5,244	2,698	8,550
Capex/Revenue (%)	10.6	14.6	25.3	19.8	9.8	12.7	7.6	10.1	9.9	21.7	7.6	28.8	4.7	13.2
Capex/EBITDA (%)	16.4	52.7	94.1	51.1	61.8	51.4	37.2	41.8	16.8	84.4	124.6	53.0	60.4	27.6

NR – Not rated.

Source: Fitch Ratings and company reports.

NOCs did not take the opportunity to reduce debt in the last few years of strong cash flow generation so credit metrics are likely to deteriorate in 2009 in tandem with the cycle. Credit metric improvements in the last few years resulted from EBITDA increases, as companies financed investments primarily with leverage. Now, NOCs will have to decide if they still want to lever up to finance aggressive capex programs set during the multi-year run up in energy prices, which reached historical highs in 2008. Should they continue to lever up, then this would be detrimental to their ratings and represent a deviation from strategies employed during previous price cycles.

NOCs carry out significant investments in countries where infrastructure projects are an integral part of the government's countercyclical response to the economic slowdown expected this year. However, the higher cost of capital and limited access to both the domestic and international debt markets are likely to drive downward revisions in NOC's capital expenditures and limit increase in leverage, which could have a negative impact on the future reserves and production prospects. However, this, to a certain extent, depends on the rate of demand recovery.

Other factors negatively affecting credit quality in the sector are the growing underfunded pension plans and contingent liabilities primarily in Latin American NOCs. In addition, new environmental regulations, asset retirement requirements and pending lawsuits are increasing off-balance-sheet obligations.

## Leverage

(USD Mil., As of Dec. 2008)

	Pemex 'BBB' Stable	PDVSA 'B+' Stable	Petrobras 'BBB' Stable	Ecopetrol 'BB+' Stable	Lukoil 'BBB-' Stable	Rosneft 'BBB-' Neg.	TNK-BP 'BBB-' Neg.	Gazprom Neft NR	KG E&P 'BBB-' Neg.	PetroChina 'A+' Stable	Sinopec 'A-' Stable	CNOOC 'A' Stable	PTT 'BBB' Stable	Petronas 'A' Stable
Total Debt	42,843	15,095	27,351	125	9,809	24,165	7,992	3,693	1,082	18,394	33,047	2,491	7,134	11,869
Off-BS Debt	38,809	22,600	33,765	2,221	4,210	1,740	—	—	—	3,980	—	—	—	1,215
Adjusted Debt	81,652	37,695	61,116	2,346	14,019	25,905	7,992	3,693	1,082	22,375	33,047	2,491	7,134	13,084
Leverage (x)	0.6	0.4	0.9	0.0	0.6	1.4	0.8	0.5	0.3	0.5	2.6	0.3	1.6	0.4
Adjusted Leverage (x)	1.1	1.1	1.8	0.4	0.8	1.5	0.8	0.5	0.3	0.6	2.6	0.3	1.6	0.4
Adjusted Debt/ P1 Reserves	5.71	0.19	5.49	2.06	0.73	1.94	0.99	1.14	1.54	1.04	8.26	0.99	7.56	0.50

Leverage – Total debt/EBITDA. Adjusted Leverage – Adjusted Debt/EBITDAR. Adjusted leverage – Total debt adjusted for operating leases, underfunded pension plans and OPEB, asset retirement obligations, guarantees and other contingent liabilities. NR – Not rated. P1 – Proved reserves.

Source: Fitch Ratings and company reports.

## Issuer List: Energy (Oil & Gas), Latin America

Issuer Name	Country	Issuer Default/Long-Term Rating	Local Currency IDR/Long-Term Rating	National Long-Term Rating	Outlook
Pan American Energy LLC	Argentina	BB-	BB	—	Stable
Pan American Energy LLC Suc. Argentina	Argentina	—	—	AAA(arg)	Stable
Petrobras Energia S.A. (Formerly Pecom Energia S.A.)	Argentina	BB-	BB	AA+(arg)	Stable
Transportadora de Gas del Sur S.A. (TGS)	Argentina	B	B+	WD	Stable
YPF S.A.	Argentina	BB-	BB	AAA(arg)	Stable
Bolivian Oil Services — Bolser Ltda.	Bolivia	—	—	C	NA
Companhia Petrolifera Marlim	Brazil	BBB	—	—	Stable
Petroleo Brasileiro S.A. (Petrobras)	Brazil	BBB	BBB+	AAA(bra)	Stable
Empresa Nacional del Petroleo (ENAP)	Chile	A	—	AAA(chl)	Stable
Empresas Copec S.A.	Chile	BBB+	BBB+	—	Stable
Gasco S.A. (Gasco)	Chile	—	—	A+(chl)	Stable
ECOPETROL S.A.	Colombia	BB+	BBB-	—	Stable
Transportadora de Gas del Interior S.A.E.S.P. (TGI)	Colombia	BB	BB	—	Negative
Refineria Dominicana de Petroleo S.A.	Dominican Republic	—	—	A-(dom)	NA
Oceanografia, S.A. de C.V.	Mexico	CC	CC	—	Negative
Petroleos Mexicanos SA (Pemex)	Mexico	BBB	BBB+	AAA(mex)	Stable
Tenaris S.A.	Mexico	A-	—	—	Stable
Petroleos de Venezuela S.A. (PDVSA)	Venezuela	B+	B+	AAA(ven)	Stable

NA – Not available. WD – Withdrawn, RWN – Rating Watch Negative.

Source: Fitch Ratings.

## Issuer List: Energy (Oil & Gas), Asia

Issuer Name	Country	Issuer Default/Long-Term Rating	Local Currency IDR/Long-Term Rating	National Long-Term Rating	Outlook
PetroChina Company Limited	China	A+	AA-	—	Stable
China Petroleum & Chemical Corporation (Sinopec)	China	A-	A-	—	Stable
CNOOC Limited (CNOOC)	China	A	A	—	Stable
Reliance Industries Ltd	India	BBB-	BBB-	AAA(ind)	Stable
Indian Oil Corporation Ltd	India	BBB-	—	AAA(ind)	Negative
PT Perusahaan Gas Negara Tbk	Indonesia	BB	BB	AA(idn)	Stable
Petronas Capital Limited	Malaysia	A	—	—	Stable
Petroleum Nasional Berhad (Petronas)	Malaysia	A	A	—	Stable
SK Energy Co., Ltd.	South Korea	BBB	—	—	Negative
Korea Gas Corporation	South Korea	A+	—	—	Negative
CPC Corporation, Taiwan*	Taiwan	A+	AA	AAA(twn)	Stable
PTT Public Company Limited	Thailand	BBB	A-	AAA(tha)	Stable

NA – Not available. WD – Withdrawn, RWN – Rating Watch Negative. \*Outlook of Local Currency Long-Term issuer default rating of CPC is Negative.

Source: Fitch Ratings.

## Issuer List: Energy (Oil & Gas), Russia and CIS

Issuer Name	Country	Issuer Default/Long-Term Rating	Local Currency IDR/Long-Term Rating	National Long-Term Rating	Outlook
JSC KazMunaiGas Exploration Production	Kazakhstan	BBB-	BBB-	—	Negative
KazMunaiGaz National Company	Kazakhstan	BBB-	BBB	—	Negative
JSC KazTransOil	Kazakhstan	BBB-	—	—	Negative
Tristan Oil Ltd.	Kazakhstan	CC	—	—	RWN
Intergas Central Asia JSC	Kazakhstan	BB+	BB+	—	Stable
KazTransGas	Kazakhstan	BB	BB	—	Stable
OJSC OC Rosneft	Russia	BBB-	BBB-	—	Negative
OAQ Gazprom	Russia	BBB	BBB	—	Negative
TNK-BP International Ltd.	Russia	BBB-	BBB-	—	Negative
OAQ LUKOIL	Russia	BBB-	BBB-	—	Stable
OAQ Tatneft	Russia	BB	—	—	Stable
OJSC Svyazinvestneftekhim (SINEK)	Russia	BBB-	BBB-	—	Stable
NJSC Naftogaz of Ukraine	Ukraine	CC	CC	—	RWN

NA – Not available. WD – Withdrawn. RWN – Rating Watch Negative.

Source: Fitch Ratings.

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