

## RATING METHODOLOGY

# Global Independent Exploration and Production Industry

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**Table of Contents:**

SUMMARY	1
ABOUT THE RATED UNIVERSE	3
ABOUT THIS RATING METHODOLOGY	4
THE KEY GRID FACTORS	7
SUMMARY OF THE GRID-INDICATED RATING OUTCOMES	15
APPENDIX A: GLOBAL E&P INDUSTRY METHODOLOGY FACTOR GRID	16
APPENDIX B: SAMPLE OF METHODOLOGY GRID-INDICATED RATINGS	17
APPENDIX B: OBSERVATIONS AND OUTLIERS FOR GRID MAPPING	18
APPENDIX C: E&P INDUSTRY OVERVIEW	19
APPENDIX D: KEY RATING ISSUES OVER THE INTERMEDIATE TERM	21
MOODY'S RELATED RESEARCH	23

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**Summary**

This rating methodology explains Moody's approach to assessing credit risk for companies in the exploration and production (E&P) industry. This publication is intended to provide a reference tool that can be used when evaluating credit profiles within the E&P industry, helping companies, investors, and other interested market participants understand how key qualitative and quantitative risk characteristics are likely to affect rating outcomes. This methodology does not include an exhaustive treatment of all factors that are reflected in Moody's ratings, but should enable the reader to understand the qualitative considerations and financial ratios that are usually most important for ratings in this sector.

This rating methodology replaces the Independent Exploration and Production (E&P) Industry methodology published in December 2008. While reflecting the same core principles as the 2008 methodology, this updated framework incorporates refinements in our analysis of the key credit fundamentals of the E&P industry. Publication of this rating methodology will not result in any rating changes.

This report includes a detailed rating grid and illustrative mapping of a sample of companies against the factors in the grid. The purpose of the rating grid is to provide a reference tool that can be used to approximate credit profiles within the E&P sector. The grid provides summarized guidance for most factors that are generally most important in assigning ratings to E&P companies. The grid is a simple summary that does not include every rating consideration. The weights shown for each factor in the grid represent an approximation of their typical importance in rating decisions, but actual importance may vary significantly, and our illustrative mapping uses historical results while our ratings consider forward-looking expectations. Accordingly, the grid-indicated rating is not expected to match the actual rating in most cases.



The grid contains four key factors that are important in our assessments for ratings in the E&P sector:

1. Reserves and Production Characteristics
2. Operating and Capital Efficiency
3. Leverage and Cash Flow Coverage
4. Production Mix Overlay

Each of these factors also encompasses a number of sub-factors or metrics, which we explain in detail. Since an issuer's scoring on a particular grid factor often will not match its overall rating, in the Appendix we include a discussion of "outliers" – companies whose grid-indicated rating for a specific factor differs significantly from the actual rating.

This rating methodology is not intended to be an exhaustive discussion of all factors that Moody's analysts consider in ratings in this sector. We note that our analysis for ratings in this sector covers factors that are common across all industries (such as ownership, management, liquidity, legal structure in the corporate organization, corporate governance) as well as factors that can be meaningful on a company specific basis. Our ratings consider qualitative considerations and factors that do not lend themselves to a transparent presentation in a grid format.

For example, our analysis considers significant non-E&P operations and their associated business risk, cash flow diversification, and possible support for leverage. Other factors we consider include geological basin diversification, production and reserve concentrations, reserve life, reserve replacement and finding and development costs.

The grid represents a compromise between greater complexity that would result in grid-indicated ratings that map more closely to actual ratings, and simplicity that enhances a succinct and transparent presentation of the factors that are most important for ratings in this sector most of the time.

Highlights of this report include:

- » An overview of the rated universe
- » Summary of the rating methodology
- » A description of key factors that drive rating quality
- » Comments on the rating methodology's assumptions and limitations, including a discussion of rating considerations that are not included in the grid

The Appendices show tables that illustrate the application of the methodology grid to a sample of companies (Appendix A), with explanatory comments on some of the more significant differences between the grid-implied rating and our actual rating (Appendix B), a brief industry overview (Appendix C), and a discussion of key rating issues for the E&P sector over the intermediate term (Appendix D).

## About the Rated Universe

Moody's rates 98 companies in the E&P industry globally. In aggregate, these issuers have approximately \$190 billion of rated debt. For purposes of this methodology, E&P companies are defined as businesses that derive the majority of their revenues from the acquisition and development of hydrocarbon resources.

Most of the rated companies are headquartered in North America and the majority are based in the US. This reflects the private (i.e., non-government) ownership of oil and natural gas reserves in North America and relatively low barriers to entry. Outside of North America, almost all of the world's oil and natural gas resources are owned or controlled by state-owned national oil companies. This geographic concentration in North America also reflects consolidation in the E&P industry – particularly in Europe – over the past quarter century. Overall, we rate 70 E&P companies in the US, 14 in Canada, 8 in Asia, 3 in Latin America, and 3 in Europe.

The published ratings of the issuers are very diverse. The corporate family rating (CFR) or senior unsecured ratings of the covered speculative grade or investment grade issuers (respectively) range from Aa to Ca with concentrations in the Baa2 and B3 rating categories. The weighted average assigned rating, by amount of rated debt, is Baa3, while the average rating by number of issuers is Ba3. As of September 30, 2011, 72 companies had stable outlooks, 13 had negative outlooks, 8 had positive outlooks, and 1 had a developing outlook. The following chart shows the distribution of ratings among a representative sample of E&P companies.

FIGURE 1

### Global Independent Exploration and Production (E&P) Industry

Company Name	Moody's Public Long Term Ratings	Outlook
CNOOC Limited (Government Related Issuer; GRI)	Aa3	Stable
Korea National Oil Corporation (GRI)	A1	Stable
Occidental Petroleum Corporation	A2	Stable
Apache Corporation	A3	Stable
Canadian Natural Resources Limited	Baa1	Stable
Devon Energy Corporation	Baa1	Stable
Encana Corporation	Baa2	Stable
Hess Corporation	Baa2	Stable
Noble Energy, Inc.	Baa2	Stable
Suncor Energy Inc.	Baa2	Stable
Murphy Oil Corporation	Baa3	Stable
Pioneer Natural Resources Company	Ba1	Stable
Chesapeake Energy Corporation	Ba2	Positive
Range Resources Corporation	Ba2	Stable
Forest Oil Corp.	Ba3	Stable
Plains Exploration & Production Co.	Ba3	Stable
EXCO Resources, Inc.	B1	Stable
MEG Energy Corp.	B1	Stable
Quicksilver Resources, Inc.	B1	Stable

FIGURE 1

**Global Independent Exploration and Production (E&P) Industry**

Company Name	Moody's Public Long Term Ratings	Outlook
Carrizo Oil & Gas, Inc.	B2	Stable
Rosetta Resources Inc.	B2	Stable
McMoRan Exploration Co.	B3	Stable
Oasis Petroleum Inc	B3	Stable
Connacher Oil and Gas Limited	Caa1	Stable
RAAM Global Energy Company	Caa1	Stable

**About this Rating Methodology**

This report explains the rating methodology for E&P companies in six sections, which are summarized as follows:

**1. Identification of Key Grid Factors**

The grid in this rating methodology focuses on four key factors. The four broad factors are further broken down into nine sub-factors.

FIGURE 2

**Global Independent Exploration and Production Industry**

Broad Rating Factors	Factor Weighting	Rating Sub-Factor	Sub-Factor Weighting
Reserves & Production Characteristics	40%	Avg Daily Production (Mboe/d) (LTM)	15%
		Proved Developed Reserves (Million boe)	15%
		Total Proved Reserves (Million boe)	10%
Operating & Capital Efficiency	20%	Leveraged Full-Cycle Ratio	20%
Leverage and Cash Flow Coverage	40%	E&P Debt / Average Daily Production	10%
		E&P Debt / PD boe Reserves	10%
		RCF / Total Debt	10%
		EBITDA / Interest Expense	10%
Production Mix Overlay (Composite Score Adjustment)		E&P Unleveraged Cash Margin / BOE	
<b>Total</b>	<b>100%</b>		<b>100%</b>

**2. Measurement or Estimation of the Key Grid Factors**

We explain below how the sub-factors for each key grid factor are calculated or estimated and the weighting for each individual sub-factor. We also explain the rationale for using each particular factor,

and the ways in which we apply them during the rating process. The information used in assessing performance for the sub-factors is found in or calculated using the company's financial statements or is derived from other observations or is estimated by Moody's analysts.

Moody's ratings are forward-looking and incorporate our expectations for future financial and operating performance. We use both historical and projected financial results in the rating process. Historical results help us understand patterns and trends for a company's performance as well as for peer comparison. While the rating process includes both historical and anticipated results, this document makes use of historical data only to illustrate the application of the rating methodology grid. Specifically, unless otherwise stated, for public filers (e.g. companies that file with the Securities and Exchange Commission, for example in the U.S.) the mapping examples use reported financials for the last twelve months ending September 30, 2011 and reserves numbers from December 31, 2010 in most cases. For non-public filers and companies outside the United States, the mapping examples use reported financials for the most recent audited period, December 31, 2010, in most cases. All of the quantitative credit metrics incorporate Moody's standard adjustments to income statement, cash flow statement and balance sheet amounts for restructuring, impairment, off-balance sheet accounts, receivable securitization programs, under-funded pension obligations, and recurring operating leases.

For definitions of Moody's most common ratio terms please see Moody's Basic Definitions for Credit Statistics, User's Guide (June, 2011, document #78480). For a description of Moody's standard adjustments, please see Moody's Approach to Global Standard Adjustments in the Analysis of Financial Statements for Non-Financial Corporations December 2010, (128137). These documents can be found at [www.moody.com](http://www.moody.com).

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### 3. Mapping Grid Factors to the Rating Categories

After estimating or calculating each sub-factor's outcome, each of the 9 sub-factor's outcomes are mapped to a broad Moody's rating category (Aaa, Aa, A, Baa, Ba, B, Caa, Ca).

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### 4. Mapping Issuers to the Grid and Discussion of Grid Outliers

In this section (Appendix B) we provide tables showing how each company's sub-factors and factors map to grid-indicated ratings. The weighted average of the sub-factor ratings produces a grid-indicated rating for each factor. We highlight companies whose grid-indicated performance on a specific sub-factor is two or more broad rating categories higher or lower than its actual rating and discuss general reasons for such positive and negative outliers for particular factors or sub-factors.

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### 5. Assumptions, Limitations and Rating Considerations Not Included in the Grid

This section discusses limitations in the use of the grid to map against actual ratings, additional factors that are not included in the grid that can be important in determining ratings, and limitations and key assumptions that pertain to the overall rating methodology.

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### 6. Determining the Overall Grid-Indicated Rating

To determine the overall rating, we convert 8 of the 9 sub-factor ratings into a numeric value based upon the scale below. This composite score is then adjusted for the ninth sub-factor (unleveraged cash margin/boe), as discussed below.

FIGURE 3

Aaa	Aa	A	Baa	Ba	B	Caa	Ca
1	3	6	9	12	15	18	20

The numerical score for 8 of the 9 sub-factors is multiplied by the weight for that sub-factor with the results then summed to produce a composite weighted factor score. We then adjust the composite weighted factor score by adding or subtracting the unleveraged cash margin composite score adjustment. The aggregate weighted total factor score is then mapped back to an alphanumeric rating based on the ranges in the table below.

FIGURE 4

#### Global Independent Exploration and Production (E&P) Industry

Grid-Indicated Rating	Aggregate Weighted Total Factor Score
Aaa	$x < 1.5$
Aa1	$1.5 \leq x < 2.5$
Aa2	$2.5 \leq x < 3.5$
Aa3	$3.5 \leq x < 4.5$
A1	$4.5 \leq x < 5.5$
A2	$5.5 \leq x < 6.5$
A3	$6.5 \leq x < 7.5$
Baa1	$7.5 \leq x < 8.5$
Baa2	$8.5 \leq x < 9.5$
Baa3	$9.5 \leq x < 10.5$
Ba1	$10.5 \leq x < 11.5$
Ba2	$11.5 \leq x < 12.5$
Ba3	$12.5 \leq x < 13.5$
B1	$13.5 \leq x < 14.5$
B2	$14.5 \leq x < 15.5$
B3	$15.5 \leq x < 16.5$
Caa1	$16.5 \leq x < 17.5$
Caa2	$17.5 \leq x < 18.5$
Caa3	$18.5 \leq x < 19.5$
Ca	$x \geq 19.5$

For example, an issuer with a composite weighted factor score of 11.7 would have a Ba2 grid-indicated rating. We used a similar procedure to derive the grid-indicated ratings in the tables embedded in the discussion of each of the four broad rating factors.

## The Key Grid Factors

Moody's analysis of E&P companies focuses on four broad factors:

- » Reserves and Production Characteristics
- » Operating and Capital Efficiency
- » Leverage and Cash Flow Coverage
- » Production Mix

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### Factor: 1. Reserves and Production Characteristics (40% weight)

#### Why it Matters

Oil and natural gas reserves are an E&P company's most valuable assets. Proved reserves represent a store of value that can be measured and compared across companies. Proved developed (PD) reserves are critically important because they are the source of oil and natural gas production and cash flow and require modest capital investment. Proved undeveloped (PUD) reserves require significant capital spending in order to convert them to PD reserves<sup>1</sup>.

Reserves and production are a more stable measure of size than financial metrics, such as assets and revenue, which are affected by accounting differences and driven by changes in commodity prices. The Reserves and Production Characteristics rating factor provides a snapshot of an E&P company's oil and natural gas asset portfolio, which are reported (and used by Moody's) on a Btu parity basis of 6:1. The economic conversion ratio can be much different, however, and typically favors oil over natural gas. We capture this differential, as well as realized prices and the costs of production, through the use of cash flow-based debt metrics and the Production Mix Overlay, which are discussed below.

Size – measured by reserves and production volumes – is important. In this sector, higher-rated companies tend to be larger than lower-rated companies. Larger companies typically have greater resources, liquidity and economies of scale that better enable them to withstand shocks or downturns compared to smaller firms.

In the E&P industry, such shocks can arise from a number of factors, including weak commodity prices; high differentials to benchmark prices, which lower realized prices; greater-than-expected geologic and reserve estimate risk; increased costs from oilfield services companies during times of tight capacity; limited capital markets access; weather; as well as limited access to take away capacity, midstream natural gas services and downstream processing.

Size is often correlated with geographic diversification, which in turn implies a certain degree of cash flow durability. Larger E&P companies tend to operate in a broader range of geographic areas and geologic basins, which provides some protection from shocks.

#### How We Assess It:

*Average Daily Production:* The supplemental oil and gas disclosures in annual audited financial reports provide an annual production figure for oil and natural gas as does the management discussion and

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<sup>1</sup> Reserves are estimated by petroleum engineers, who are either employees of the company or outside independent petroleum engineers (IPE). The estimates are generally produced annually.

analysis section. Average daily production volumes are generally reported quarterly and we use this data to track a company's intra-year production trend, and also to calculate production volumes on a last twelve months (LTM) basis. Production, which underpins sales and cash flow, is measured more accurately than reserve volumes. Industry and regulatory standards define how volumes of oil and natural gas are measured, which provides a greater degree of reliability and transparency.

In addition to the overall trend, we examine the volatility of a company's production. Oil and natural gas production translates directly into revenue, so production volatility implies cash flow volatility, which is important to creditors. Lower production volatility means greater consistency and durability of the company's cash flow.

Note on net production calculations: U.S. companies report net production (production after royalties are paid), while in Canada, companies report gross production (production before royalties are paid). Because production volumes associated with royalties do not affect an E&P company's financial performance, we calculate production metrics on a net basis. In contrast to production, reserves are reported in both the U.S. and Canada on a net basis, which is what we use for our calculations.

*Reserves:* While it is important to know a company's reserves at a point in time, or its production for a particular quarter, we are also interested in a company's reserves and production trends over a multi-year period. We evaluate companies dynamically with a forward view. To do so, we look at the overall trend in reserves and production and evaluate whether, and why, they are generally increasing or decreasing.

The greatest challenge in measuring reserves is the fact that companies are required to disclose their reserves only once a year. The further we get from the annual report, the lower the significance of reported prior year-end reserves. For significant acquisitions or divestitures, we add (or deduct) disclosed volumes to (or from) the prior year-end reserves volumes to derive a pro forma intra-year reserves figure.

Another challenge is to assess the reserves information that a company provides with the appropriate context and understanding of its subjectivity and limitations. The term "proved reserves" implies a volume that is known with certainty, but in fact, proved reserves cannot be measured directly. They are estimates of reserves made by the companies and by third party independent petroleum engineers. Moody's qualitatively considers the company's policies and procedures for developing its proved reserves estimates – including the use of independent petroleum engineers – and the critical assumptions and estimates made by management.

FIGURE 5

**Factor 1. Reserves and Production Characteristics (40%)**

	Sub-factor Weight	Aaa	Aa	A	Baa	Ba	B	Caa	Ca
Avg Daily Production (Mboe/d) (LTM)	15%	≥ 2,750	1,100 - 2,750	550 - 1,100	140 - 550	55 - 140	20 - 55	10 - 20	< 10
Proved Developed Reserves (Million boe)	15%	≥ 8,000	4,000 - 8,000	1,500 - 4,000	300 - 1,500	100 - 300	25 - 100	10 - 25	< 10
Total Proved Reserves (Million boe)	10%	≥ 10,000	5,000 - 10,000	2,000 - 5,000	500 - 2,000	100 - 500	30 - 100	10 - 30	< 10



## Factor 2: Operating and Capital Efficiency (20% Weight)

### Why It Matters

E&P companies are in a commodity business in which no single company controls the price of the product it sells. Companies are also subject to the inherent quality of their reserves and production. Cash margins are a function of the cost to produce from a given reservoir, the realized price from that reservoir's production, and the producer's ability to control its cash operating costs.

Similarly, Finding and Development (F&D) costs reflect the capital cost of acquisition, exploration and development of a given reservoir, as well as the producer's ability to control development costs. F&D cost is a unit measure of the total costs invested or incurred to add and develop a barrel of new reserves to the point of production. The lower a company's F&D costs, the more profitable its operations will be in a wider range of price environments. F&D costs are influenced by numerous variables, including the complexity and size of the reservoir, reserve booking practices, timing issues such as development approvals, and the length of the development cycle.

The leveraged full-cycle ratio (LFCR) reflects the productivity of reinvested capital on a boe basis, comparing the cash margin generated by a produced boe with the capital (F&D) costs needed to replace that boe. This is an important measure that indicates whether a company generates a positive return on its overall production, and whether it is competitive with its peers. E&P companies are highly capital intensive, constantly reinvesting and raising external debt and equity capital.

For the purposes of the LFCR metric presented herein, we use three-year average F&D costs — recognizing that the reserves replacement process typically spans years, from the time capital is spent for initial work until reserves are proved, as well as follow-up exploitation and development. In some cases, such as oil sands steam assisted gravity design (SAGD) & mining, and deepwater development, a longer view is also considered, as these developments can take 5 years or more, with significant reserves added at the back-end of the development process. We also consider one-year values to get a sense of recent performance, and the direction of cost trends.

The LFCR is a comprehensive metric that considers a company's oil and natural gas portfolio as reflected in the company's realized price, cash costs, and re-investment risk based on F&D costs. This measure provides an indication — regardless of costs or prices — about which companies are better at generating cash-on-cash returns. A higher rating would be associated with an LFCR that is consistently higher through varying price and cost environments.

### How We Assess It:

*Leveraged Full-Cycle Ratio:* The leveraged full-cycle ratio is the cash margin generated per boe of production divided by three-year average all-sources F&D costs. Cash margin per boe is the realized price per boe minus cash operating, G&A, and interest costs per boe. For realized prices, we strip out non-E&P revenue, but include realized hedging gains or losses. Realized prices also reflect the quality of the commodity produced and transportation or basis differentials.

*Finding and Development Costs:* In our LFCR metric, we use three average year all-sources unit F&D costs, which are calculated by dividing total costs incurred (acquisitions + exploration + development + goodwill booked in corporate E&P acquisitions) by total boe reserve additions. Costs incurred are disclosed as part of the supplementary oil and gas information, while acquisition goodwill is generally disclosed in the financial statements.

**Calculating the Leveraged Full-Cycle Ratio**

Realized price per boe production (reflects basis differentials, transportation and hedging)

- » Minus: Operating costs per boe
- » Minus: Total G&A expense (including capitalized portion) per boe
- » Minus: Total interest expense (including capitalized portion) per boe

Equals: Leveraged pre-capex cash margin per boe

- » Divided by: Three year average all sources F&D costs

Equals: Leveraged Full-Cycle Ratio

FIGURE 6

**Factor 2. Operating and Capital Efficiency (20%)**

	Sub-factor Weight	Aaa	Aa	A	Baa	Ba	B	Caa	Ca
Leveraged Full-Cycle Ratio	20%	≥ 5x	3.5x - 5x	2.75x - 3.5x	2.0x - 2.75x	1.5x - 2.0x	1x - 1.5x	0.5x - 1x	< 0.5x

**Factor 3: Leverage and Cash Flow Coverage (40% Weighting)****Why It Matters**

Leverage and cash flow coverages are critical rating factors that provide an indication for financial risk and an issuer's level of financial flexibility, and provide insight into a given management team's financial policy. Financial risk is particularly important for E&P companies because the industry is cyclical, subject to the vagaries of commodity prices, and capital intensive. Leverage and cash flow coverage metrics indicate a company's ability to fund negative free cash flow with debt while it moves through the development cycle to full production and cash flow generation.

*Debt Allocation to Non-E&P Businesses*

Many E&P companies have significant other businesses, such as refining and marketing, midstream natural gas, chemicals, and natural gas distribution. We generally view these other businesses as supporting credit quality and, by extension, the rating of the standalone E&P business. These other businesses tend to be natural extensions of E&P, providing a degree of both business risk and cash flow diversification. We account for the value of these other operations to the extent they are conducted with third parties by attributing some portion of the company's debt and interest expense as well as G&A and direct operating costs to these businesses. The E&P leverage metrics are then calculated using the remaining debt to determine E&P-only leverage.

**Debt Adjustments:** Moody's adjusts balance sheet debt for such off-balance sheet items as operating leases and unfunded pension liabilities, and the debt component of hybrid securities, including preferred stock, in accordance with Moody's standard adjustments. For E&P companies, we adjust for transactions that represent foregone capital spending, such as the leasing of an offshore production spar. We generally do not include obligations that are akin to operating costs or reflect purchasing a service (such as drilling rig commitments or capacity commitments to secure pipeline transportation).

#### How We Assess It:

*E&P Debt to Average Daily Production (10%):* E&P Debt divided by Average Daily Production

This metric is important as it measures leverage against an E&P company's production, from which it generates cash flow, but does so without the swings caused by commodity price gyrations.

*E&P Debt to Proved Developed Reserves (10%):* E&P Debt divided by Proved Developed Reserves

Oil and natural gas reserves are an E&P company's principal store of value. Our analysis focuses on PD reserves since these are the company's cash-generating assets. Both debt and PD reserves are point-in-time measures, while debt to production and cash flow measures compare a balance sheet value to a flow measurement.

Comparing E&P debt to reserves is conceptually similar to a "loan to value" measure. It is also analogous to the process that banks use when calculating a borrowing base, which is typically done for smaller, non-investment-grade E&P companies. Through the borrowing base process, banks calculate the debt capacity that a given quantity of reserves will support. As E&P companies grow, they move from borrowing base credit facilities to corporate facilities, but the general principle remains: an E&P company's leverage or debt capacity relates to its underlying cash generating assets.

*Retained Cash Flow (RCF) to Debt (10%):* Retained Cash Flow divided by Total Debt

Funds from Operations less Dividends to Total Debt. RCF is measured on a total company basis, i.e. it is not an E&P specific measure.

RCF to Debt is an indicator of a company's financial flexibility as it measures a company's total cash flow coverage of debt, indicating how much additional debt a company can absorb within the bounds of its existing rating, and how quickly debt could be repaid after current-period fixed cash expenses, including dividends, are met. We look at available cash flow to repay debt after dividend payments as we believe most companies are reluctant to reduce or discontinue dividend payments.

*EBITDA to Interest (10%):* EBITDA divided by Interest

EBITDA to Interest is the ratio of earnings before interest, taxes, depreciation and amortization to gross interest expense.

This ratio measures an issuer's ability to cover interest expense and other fixed charges such as rental expenses. It can be a particularly important measure for low rated companies. Based on Moody's standard adjustments for operating leases, in this metric one-third of rent expense is added back to interest expense - the remaining two-thirds of rent expense is added to depreciation expense.

We adjust our cash flow and EBITDA metrics to try to make ratios comparable regardless of accounting method (full-cost or successful efforts), including adding back exploration charges to EBITDA.

EBITDA and RCF are pre-capex measures of cash flow and do not reflect the capital intensive, depleting asset nature of E&P companies. As such, we also consider free cash flow (FCF). In a capital intensive industry in which companies frequently generate negative FCF over a development cycle, this measure is important in gauging a company's ability to generate sufficient cash flow to support its debt

through the development cycle. We also consider what level of capital would be required to sustain flat production.

We recognize that EBITDA and RCF will be volatile due to changing commodity price environments and consider a wide range of possible price and cost dynamics.

FIGURE 7

**Factor 3. Leverage and Cash Flow Coverage (40%)**

	Sub-factor Weight	Aaa	Aa	A	Baa	Ba	B	Caa	Ca
E&P Debt / Average Daily Production	10%	< \$4.5k	\$4.5k - \$9k	\$9k - \$15k	\$15k - \$21k	\$21k - \$27k	\$27k - \$33k	\$33k - \$39k	≥\$39k
E&P Debt / PD boe Reserves	10%	< \$1	\$1 - \$3	\$3 - \$5	\$5 - \$7	\$7 - \$9	\$9 - \$12	\$12 - \$15	≥\$15
RCF / Total Debt	10%	≥125%	100% - 125%	75% - 100%	50% - 75%	35% - 50%	20% - 35%	10% - 20%	< 10%
EBITDA / Interest Expense	10%	≥ 35x	25x - 35x	15x - 25x	10x - 15x	6x - 10x	2x - 6x	0.5x - 2x	< 0.5x

**Factor 4: Production Mix****Why It Matters**

The unleveraged cash margin available on each boe of production is an important measure in determining the underlying economic value of a company's production. It is also an indicator of the value of a company's overall reserves to the extent they are roughly aligned with its production profile. This measure captures both realized prices and the cost of production, and is significantly influenced by the company's mix of production between oil, natural gas and natural gas liquids (NGL).

Realized price is important not just in capturing the different broad economics of oil and natural gas, but also captures, for natural gas, the difference in basin prices, and for oil, the differences in realized prices given the quality of the oil sold (e.g. bitumen vs. heavy oil vs. light sweet crude), and in the selling price realized for oil of similar quality (WTI vs. Brent vs. other international pricing indices). Realized price also captures different royalty regimes and production taxes.

The costs of production are equally important and as variable as realized prices, and also reflect transportation costs.

**How We Assess It:**

*Unleveraged Cash Margin/boe:* E&P Revenues per boe minus E&P production costs per boe minus E&P general and administrative costs per boe.

We assign a numerical score to a range of unleveraged cash margins as per the table immediately below, and add or subtract that score to adjust the composite weighted total factor score as described in Section 6 above (Determining the Overall Grid Indicated Score). For example, an unleveraged cash margin in excess of \$45 per boe would have a numerical score of minus 1, which would reduce the aggregate weighted total factor score and result in a one notch up lift to the grid-indicated rating, which is the maximum possible. In contrast, an unleveraged cash margin of less than \$10 per boe would result in the addition of 0.4 to the aggregate weighted total factor score, potentially lowering the grid-indicated rating outcome.

FIGURE 8

**Factor 4: Production Mix Overlay**

	Aaa	Aa	A	Baa	Ba	B	Caa	Ca
<i>Composite Score Adjustment</i>	-1	-0.8	-0.6	-0.4	-0.2	0	0.2	0.4
E&P Unleveraged Cash Margin / BOE	≥ \$45	\$40 - \$45	\$35 - \$40	\$30 - \$35	\$25 - \$30	\$20 - \$25	\$10 - \$20	< \$10

**Assumptions, Limitations and Rating Considerations that are not Covered in the Grid**

The rating methodology grid incorporates a trade-off between simplicity that enhances transparency and greater complexity that would enable the grid to map more closely to actual ratings. The four rating factors in the grid do not constitute an exhaustive treatment of all of the considerations that are important for ratings of E&P companies. They also represent a historical look back which may or may not represent our forward looking view, which is the basis for our rating determination.

In choosing metrics for this rating methodology grid, we did not include certain important factors that are common to all companies in any industry, such as the quality and experience of management, management appetite for risk, financial policy, assessments of corporate governance, and the quality of financial reporting and information disclosure. The assessment of these factors can be highly subjective and variable over time. Accordingly, ranking them by rating category in a grid would in some cases suggest too much precision and stability in the relative ranking of particular issuers against all other issuers that are rated in various industry sectors.

Ratings may include additional factors that are difficult to quantify or that only have a meaningful effect in differentiating credit quality in some cases. Such factors include regulatory, litigation, liquidity, technology and reputational risk as well as changes to consumer and business spending patterns, competitors' strategy and macroeconomic trends. While these are important considerations, it is not possible to precisely express these in the rating methodology grid without making the grid excessively complex and significantly less transparent.

Ratings may also reflect circumstances in which the weighting of a particular factor is significantly different from the weighting suggested by the grid. This variation in weighting as a rating consideration can also apply to factors that we choose not to represent in the grid. For example, liquidity is a rating consideration frequently critical to ratings and which may not, in other circumstances, have a substantial impact in discriminating between two issuers with a similar credit profile. Ratings can be heavily affected by extremely weak liquidity that magnifies default risk. However, two identical companies might be rated the same if their only distinguishing feature is that one has a good liquidity position and the other an extremely good liquidity position. This illustrates some of the limitations inherent in using grid-indicated ratings to predict rating outcomes.

Our ratings incorporate expectations for future performance, while the financial information used to illustrate the mapping in the grid is mainly historical. In some cases, our expectations for future performance may be informed by confidential information that we cannot publish. In other cases, we estimate future results based on past performance, industry trends, our expectations for the likely range of future supply, demand and prices, competitor actions and other factors. In either case, predicting the future is subject to a risk of substantial inaccuracy. Assumptions that can cause our forward-looking expectations to be incorrect include unanticipated changes in any of the following factors: the macroeconomic environment and general financial market conditions, industry competition, new technology, regulatory and legal actions and management's appetite for M&A or share buybacks.

### Other Rating Considerations

Moody's considers additional factors, including future operating and financial performance that may deviate from historic performance, the quality of management, corporate governance, financial controls, liquidity management, event risk and seasonality. The analysis of these factors remains an integral part of our rating process.

### Management Quality

The quality of management is an important factor supporting a company's credit strength. Moody's normally meets with senior executives as part of its effort to assess management's business strategies, policies, and philosophies.

Once established, a record of consistency provides Moody's with insight into management's likely future performance in stressed situations and can be an indicator of management's tendency to depart significantly from its current business philosophy.

### Corporate Governance

Among the areas of focus in corporate governance are audit committee financial expertise, the incentives created by executive compensation packages, related party transactions, interactions with outside auditors, and ownership structures.

### Financial Controls

Moody's relies on the accuracy of audited financial statements to assign and monitor ratings. Weaknesses in the overall financial reporting processes, financial statement restatements or delays in SEC or other regulatory filings are indications of a potential breakdown in internal controls.

### Liquidity Management

Liquidity is especially critical in the non-investment grade area where issuers typically have less operating and financial flexibility. Moody's forms an opinion on likely near-term liquidity requirements from both a cash source and cash use aspect. This may include monitoring bank covenants and compliance cushion to assess whether the company is likely to require covenant relief in the event of even a modest industry downturn or an issuer specific decline in performance.

E&P companies' liquidity is bolstered by several unique attributes. They typically have conservative financing structures, high EBITDA margins, and the ability to raise cash by selling into the transparent and liquid market for oil and gas assets. They can also employ short-term deferrals of capital investment during periods of stress. Most speculative-grade E&P companies have senior secured credit facilities with sufficient availability to support at least the next 12 months of capital expenditures, providing protection in cyclical downturns.

### Event Risk

We also recognize the possibility that an unexpected event could cause a sudden and sharp decline in an issuer's fundamental creditworthiness. Typical special events include capital restructuring programs, litigation, large share repurchases, and large oil spills or other environmental disasters.

### Political Risk

Geographic and geopolitical risk concentrations can be an important consideration in assessing a company's credit risk. Considering the significant investments required to develop remote oil and gas reserves, the political stability of a region can be an important factor in assessing a company's financial

health. Generally speaking, the greater an issuer's exposure to a particular region (in terms of both producing assets and reserves), the more important that region becomes in the overall analytical process. Similarly, the degree to which an E&P company's assets are concentrated by geography or basin can have a significant impact on its rating.

### Summary of the Grid-Indicated Rating Outcomes

The methodology grid-indicated ratings are generally based on last twelve month financial data as of September 30, 2011. The grid-indicated ratings for the 20 company sample map to current assigned ratings as follows (see appendix for details):

- » 4 companies map to their assigned rating
- » 10 companies have a grid-indicated rating that is one alpha-numeric notch from their assigned rating
- » 4 companies have a grid-indicated rating that is two alpha-numeric notches from their assigned rating
- » 2 companies have a grid-indicated rating that is three alpha-numeric notches from their assigned rating

## Appendix A. Global E&P Industry Methodology Factor Grid


Factor 1. Reserves and Production Characteristics (40%)									
	Sub-factor Weight	Aaa	Aa	A	Baa	Ba	B	Caa	Ca
Avg Daily Production (Mboe/d) (LTM)	15%	≥2,750	1,100 - 2,750	550 - 1,100	140 - 550	55 - 140	20 - 55	10 - 20	< 10
Proved Developed Reserves (Million boe)	15%	≥8,000	4,000 - 8,000	1,500 - 4,000	300 - 1,500	100 - 300	25 - 100	10 - 25	< 10
Total Proved Reserves (Million boe)	10%	≥10,000	5,000 - 10,000	2,000 - 5,000	500 - 2,000	100 - 500	30 - 100	10 - 30	< 10
Factor 2. Operating and Capital Efficiency (20%)									
	Sub-factor Weight	Aaa	Aa	A	Baa	Ba	B	Caa	Ca
Leveraged Full-Cycle Ratio	20%	≥5x	3.5x - 5x	2.75x - 3.5x	2.0x - 2.75x	1.5x - 2.0x	1x - 1.5x	0.5x - 1x	< 0.5x
Factor 3. Leverage and Cash Flow Coverage (40%)									
	Sub-factor Weight	Aaa	Aa	A	Baa	Ba	B	Caa	Ca
E&P Debt / Average Daily Production	10%	< \$4.5k	\$4.5k - \$9k	\$9k - \$15k	\$15k - \$21k	\$21k - \$27k	\$27k - \$33k	\$33k - \$39k	≥\$39k
E&P Debt / PD boe Reserves	10%	< \$1	\$1 - \$3	\$3 - \$5	\$5 - \$7	\$7 - \$9	\$9 - \$12	\$12 - \$15	≥\$15
RCF / Total Debt	10%	≥125%	100% - 125%	75% - 100%	50% - 75%	35% - 50%	20% - 35%	10% - 20%	< 10%
EBITDA / Interest Expense	10%	≥35x	25x - 35x	15x - 25x	10x - 15x	6x - 10x	2x - 6x	0.5x - 2x	< 0.5x
Factor 4. Production Mix Overlay									
		Aaa	Aa	A	Baa	Ba	B	Caa	Ca
Composite Score Adjustment		-1	-0.8	-0.6	-0.4	-0.2	0	0.2	0.4
E&P Unleveraged Cash Margin / BOE		≥ 45	40 - 45	35 - 40	30 - 35	25 - 30	20 - 25	10 - 20	< 10




## Appendix B: Sample of Methodology Grid-Indicated Ratings

## Global Independent Exploration and Production (E&amp;P) Industry

Company	Reporting Period	Moody's Rating	Outlook	Grid Indicated Rating	Avg Daily Production (Mboe/d)	Proved Developed Reserves (Million boe)	Total Proved Reserves (Million boe)	Leveraged Full-Cycle Ratio	E&P Debt / Average Daily Production	E&P Debt / PD boe Reserves	RCF / Total Debt	EBITDA / Interest Expense	E&P Unleveraged Cash Margin / BOE
CNOOC Limited	6/30/2011(L)	Aa3* (BCA A2)	Stable	A1	A	A	A	Baa	Aa	Baa	Aaa	Aaa	Aaa
Occidental Petroleum Corporation	9/30/2011 (L)	A2	Stable	Aa3	A	A	A	Baa	Aa	Aa	Aaa	Aaa	Aaa
Apache Corporation	9/30/2011 (L)	A3	Stable	A2	A	A	A	Ba	A	A	Aa	Aa	Aa
Canadian Natural Resources Limited	9/30/2011 (L)	Baa1	Stable	A3	Baa	A	A	Baa	Baa	A	Baa	A	Aa
Devon Energy Corporation	9/30/2011 (L)	Baa1	Stable	Baa1	A	A	A	Ba	Baa	Baa	Baa	Baa	Baa
Encana Corporation	9/30/2011 (L)	Baa2	Stable	Baa3	A	Baa	A	B	Baa	Ba	Ba	Ba	B
Hess Corporation	9/30/2011 (L)	Baa2	Stable	Baa1	Baa	Baa	Baa	Baa	Baa	Ba	Baa	Baa	Aaa
Noble Energy, Inc.	9/30/2011 (L)	Baa2	Stable	Baa2	Baa	Baa	Baa	Baa	Baa	Ba	Ba	A	Ba
Murphy Oil Corporation	9/30/2011 (L)	Baa3	Stable	A3	Baa	Baa	Ba	Ba	A	Baa	Aa	Aa	Aaa
Pioneer Natural Resources Company	9/30/2011 (L)	Ba1	Stable	Baa3	Ba	Baa	Baa	Ba	Ba	A	Baa	Ba	Baa
Chesapeake Energy Corporation	9/30/2011 (L)	Ba2	Positive	Ba1	A	A	A	B	B	B	B	Ba	B
Range Resources Corporation	9/30/2011 (L)	Ba2	Stable	Baa2	Ba	Baa	Baa	Aa	Ba	A	B	B	B
Forest Oil Corp.	9/30/2011 (L)	Ba3	Stable	B1	Ba	Ba	Ba	Caa	Caa	Ba	B	B	B
Plains Exploration & Production Co.	9/30/2011 (L)	Ba3	Stable	B2	Ba	Ba	Ba	Ca	Caa	Ca	B	B	Baa
EXCO Resources, Inc.	9/30/2011 (L)	B1	Stable	Ba3	Ba	Ba	Ba	B	Baa	Caa	B	Ba	B
Quicksilver Resources, Inc.	9/30/2011 (L)	B1	Stable	B1	Ba	Baa	Ba	Caa	B	Baa	Caa	B	Caa
Carrizo Oil & Gas, Inc.	9/30/2011 (L)	B2	Stable	B2	B	B	Ba	B	B	B	Caa	B	Caa
McMoRan Exploration Co.	9/30/2011 (L)	B3	Stable	Caa1	B	B	B	Ca	Caa	Ca	Caa	B	B
Connacher Oil and Gas Limited	9/30/2011 (L)	Caa1	Stable	Caa3	Caa	B	Ba	Ca	Ca	Ca	Ca	Caa	Caa
RAAM Global Energy Company	9/30/2011 (L)	Caa1	Stable	B2	Caa	Ca	Caa	B	Baa	Ca	Ba	Ba	A

 Negative Outlier - 2 or more rating categories below the actual rating

 Positive Outlier - 2 or more rating categories above the actual rating

## Appendix B: Observations and Outliers for Grid Mapping

**Occidental Petroleum:** Certain leverage ratios and the cash flow coverage ratio are positive outliers as the company maintains a conservative leverage ratio to maximize its flexibility to make large investments in politically sensitive geographies. The company also has a large proportion of its production indexed to water-borne crude oil pricing.

**Encana Corporation:** The leveraged full-cycle ratio is a negative outlier, reflecting the low unleveraged cash margin that results from its production base, which is composed almost entirely of natural gas.

**Murphy Oil:** Cash flow and interest coverage ratios are positive outliers, which help to offset both the relatively smaller scale of the company's total reserves compared to its investment grade peers and its short proved developed reserve life, which signals higher capital intensity.

**Chesapeake Energy Corporation:** Chesapeake is a positive outlier for asset scale as the company has rapidly grown over the past decade to become one of the largest independent E&P companies. The benefits of this larger scale are offset by its relatively weak leveraged full-cycle ratio and leverage metrics that map to the B-rating category, a legacy of funding its rapid growth with debt.

**Range Resources:** The leveraged full-cycle ratio is a positive outlier primarily because Range enjoys a low F&D cost through its position as an early entrant into the unconventional Marcellus Shale play. The debt to PD Reserves ratio is a positive outlier because Range's low F&D cost allows it to efficiently book reserves and the recent sale of non-core assets reduced debt in the short term.

**Forest Oil:** The leveraged full-cycle ratio is a negative outlier as a result of high F&D costs incurred as the company transformed its focus from offshore to onshore; F&D Costs should begin to moderate with lower risk drilling programs. The company is a negative outlier for debt to production as a result of debt incurred also to facilitate its transformation away from offshore, exacerbated in the near term by the impact of asset sales and divestitures.

**Plains Exploration:** The leveraged full-cycle ratio is a negative outlier, which reflects the impact of 2008's negative price revision on its three-year all-sources F&D Costs, exacerbated by unproved property acquisitions. One-year F&D Costs have decreased to more competitive levels. Debt to Production and debt to PD Reserves are negative outliers, because of high debt levels incurred on up-cycle acreage acquisitions.

**Quicksilver Resources:** PD reserves is a positive outlier because of very long-lived reserves in the Barnett Shale, which also drive low debt to PD. However, these reserves are primarily natural gas, which at current prices results in weak returns (LFCR), cash margins (E&P unleveraged cash margin) and cash flow coverage of debt (RCF to debt).

**McMoRan Exploration:** McMoRan is a negative outlier for the LFCR and debt to PD Reserves as the company has spent an extraordinary amount of capital to develop deep offshore projects, with the reserves yet to be proven.

**Connacher Oil and Gas:** Total proved reserves is a positive outlier, which is not uncommon for oil sands companies that tend to have very large, long lived reserves, but high operating and development costs.

## Appendix C: E&P Industry Overview

The global oil and natural gas industry explores for underground hydrocarbon reservoirs, develops these resources by drilling wells, and produces oil and natural gas through these wells. Produced natural gas is gathered and processed, separating the gas (methane) from natural gas liquids (NGLs – ethane, propane, butane and natural gasolines); liquids are fractionated into their component parts; and the natural gas and the fractionated liquids are stored, transported and marketed. Oil is transported to refineries, where it is converted to products that include gasoline, diesel, heating oil and jet fuel. These products are marketed to wholesale and retail customers. E&P is considered the “upstream” portion of the industry, and companies that conduct exploration and production activities are the focus of this methodology<sup>2</sup>.

We note that there are essentially two strategies of reserves replacement, both of which are important in understanding and assessing an E&P company's risks. The first strategy, commonly referred to as organic or drillbit reserves replacement, involves finding new sources of oil and natural gas. This includes some combination of exploration, which is typically higher risk; exploitation of previously discovered reservoirs, which is lower risk; and improved recovery, which includes supplemental recovery methods such as thermal recovery and water flooding, with a risk level in between exploration and exploitation.

The second strategy of reserves replacement, commonly called acquire and exploit, has typically involved buying another company, or properties from another company. Acquiring reserves includes a wide range of risks, depending on the maturity of the acquired assets within the spectrum of a reservoir's life cycle. E&Ps also actively engage in the acquisition of raw, undeveloped acreage with the hope of establishing a new source of reserves and production growth. This strategy is riskier than the acquire and exploit strategy, and can be thought of as acquire and explore since many of these plays are in their early stages.

### Finite Assets with Commodity Price Exposure

Our credit assessment of companies in the E&P industry is shaped by the fact that these companies' assets are finite resources subject to both depletion and unpredictable commodity prices.

Moody's evaluates historical operating and financial performance, cash flow, debt service coverage and leverage. However, while financial results and ratios are important to credit ratings, an E&P company's future prospects are not entirely or directly captured in its reported financial statements. Oil and natural gas assets are finite resources that deplete and decline over time, with some declining much faster than others. To be successful and remain in business, an E&P company must reinvest substantial capital each year to find new reserves and replace production. Furthermore, the oil and natural gas industry is a commodity business, in which producers are price takers who cannot control commodity prices.

To better assess a company's future performance, we evaluate a variety of oil and natural gas reserves-related measures. Reserves data are provided in supplemental disclosures and petroleum engineering reports. Companies that file with the U.S. Securities and Exchange Commission (SEC) comply with

<sup>2</sup> The remaining activities are part of the “midstream” sector (gathering, processing, fractionating, transportation and storage) and the “downstream” sector (refining and marketing). The Global Midstream Energy Methodology (December 2010) discusses the midstream sector. Refining and marketing companies are discussed in the Global Refining and Marketing Rating Methodology (December 2009). Companies that conduct all of these activities (vertically integrated) are discussed in a fourth methodology, Global Integrated Oil & Gas Industry (November 2009). Finally, the companies that service the entire oil and gas industry are covered in the Global Oilfield Services Rating Methodology (December 2009)

its guidelines for reporting reserves. These guidelines require annual disclosure of certain information regarding total proved and proved developed reserves as well as the costs incurred in reserves-replacement activities.

We also focus on cost structure and operating efficiency, which are factors that companies can more easily control, but are also a product of the particular reserves being exploited. The combination of depleting assets, technical challenges and unpredictable commodity prices require that E&P companies maintain appropriate capital structures and avoid high financial leverage.

## Appendix D: Key Rating Issues over the Intermediate Term

### Sustainability of Supportive Oil and Gas Prices

The oil and gas industry is currently experiencing a marked split in the value of oil and natural gas. Oil prices are robust, leading to strong returns and cash flows for oil predominant producers, while natural gas prices are at very low levels, pressuring the margins and returns of natural gas predominant producers. Furthermore, beginning in early 2011, the differential between WTI and Brent (and other international indices) reversed course to trade not just in favor of Brent, but at a very wide differential.

We publish price ranges that we think are most likely for oil and natural gas, the WTI / Brent differential and for natural gas liquids. We also publish prices for oil and natural gas that could be used for stress case analysis. Price assumptions are typically shown for the current year, next year and 'thereafter'. These assumptions are meant to be realistic, but are also meant to be durable, i.e. we do not ratchet them up and down with normal price volatility. Various stress case prices are used to support subjective assessments of an issuer's ability to withstand short term price drops to these levels from a both liquidity and rating perspective.

### Ability to Replace Reserves and Grow Production

E&P companies are finding it increasingly challenging to replace their reserves and grow production, especially organically or through the drillbit. The oil and gas industry, particularly in North America, is becoming more mature, with virtually all major conventional onshore basins and the Gulf of Mexico shelf in decline. As conventional oil and gas opportunities become more scarce, companies are drilling in ever deeper water offshore, conducting more exploration and development operations internationally, and putting more focus on unconventional natural gas reservoirs, oil shales and oil sands. Companies are also using horizontal drilling and fracturing technology to develop unconventional shale gas and shale oil. The advent of unconventional shale gas drilling in North America has led to significant additions of proved undeveloped natural gas reserves that have relatively low value at current natural gas prices.

In response, more E&P companies are acquiring oil and gas assets, as well as entire companies. Rather than taking on rank exploration, many companies have turned to acquiring raw undeveloped acreage to work through the complexities of extracting oil and natural gas from shale plays in North America. In the past year many of the existing producers/acreage holders in North American shale gas plays have sold joint venture interests to a spate of major international and national oil companies.

Also challenging reserves replacement is restricted access to many prospective drilling areas, including much of the U.S. offshore and parts of Alaska. Internationally, most potential oil and gas acreage is controlled by national oil companies.

As a result of North America's maturity and limited access to drilling opportunities, competition among E&P companies has intensified. Independent E&P companies are competing with the major integrated oil companies as well as with national oil companies, both of which tend to be larger and better capitalized. Companies with less durable portfolios of oil and gas assets will be challenged to replace reserves, grow production and maintain their ratings.

### Rising Costs Structures

As commodity prices increase, companies' cost structures, both capital and operating, have come under considerable pressure. Capital costs are rising because of acquisitions, many at historically high prices. In addition, capital costs have risen because of increased competition among producers for drilling rigs, workover and completion rigs, fracturing, and other oilfield services. As noted, E&P companies, challenged to replace production, are drilling in ever deeper waters, drilling deeper and longer wells, often horizontally, and employing more technically complex completion techniques, all of which are increasing capital costs. The increasing proportion of shales and other unconventional reservoirs is steepening the industry's decline curve and increasing services intensity, thereby increasing the cost to maintain and grow production.

In addition to higher capital expenses, higher commodity prices are also having a direct impact on cash operating costs, including production and severance taxes, electricity, gas compression and supplemental recovery such as thermal and carbon dioxide flooding. If there is significant softening in commodity prices, companies with higher cost structures will be challenged and their ratings could be pressured.

### Infrastructure

The need for infrastructure to transport oil and natural gas to processing, upgrading, and refining and conversion assets and to consuming regions is changing given the development of resources in regions such as the Marcellus, the Bakken, the Permian and Eagle Ford basins, and the rapid expansion of oil sands production in Canada. These developments bring the need for new pipelines in particular, and in some cases the reversal in flow of existing pipelines. This will be an ongoing process that is particularly important in reducing basis differentials, reducing the WTI discount to Brent, reducing light / heavy differentials, and enabling access to the markets where the most favorable pricing can be obtained.

### Industry Consolidation

We expect to see continued consolidation in the industry following the trend of a number of companies heavily reliant on easy capital market access for funding aggressive drilling programs. Given the currently unsettled capital markets for speculative grade issuers in particular, many of the smaller speculative grade companies may find themselves unable to aggressively drill properties once currently good liquidity is used up. This may lead to consolidation opportunities for those larger players that have funded themselves adequately and have ample capital to deploy against newly acquired properties. Along with the usual merger challenges of management, culture and integration, these companies face difficult valuation issues. As noted, companies have often paid historically high prices, particularly for acreage, leading to increased leverage. Event risk around such acquisitions will be a ratings consideration as well.

## Moody's Related Research

### Industry Outlooks:

- » [Asia-Pacific E&P: Upstream Asset Acquisitions: Short-Term Pain, Long-Term Gain, October 2011 \(136338\)](#)
- » [Global Independent E&P: Historically High Oil Prices Spur Production Push, Outpacing Escalating Costs for E&Ps, April 2011 \(132846\)](#)
- » [Global R&M Outlook Update: R&M Earnings Set To Drop as Global Capacity Rises and US Midcontinent Advantages Fade, December 2011 \(138088\)](#)
- » [Asia Pacific R&M: Rising Capex, Slowing Demand Constrain Credit Profiles, October 2011 \(136749\)](#)
- » [Global Integrated Oil & Gas Industry Outlook Update: Moderation in Oil Prices and Pressure on Downstream Activities are Likely to Dampen Earnings Growth in 2012, September 2011 \(136270\)](#)
- » [Global Oilfield Services: Drilling and Oilfield Service Companies Enjoy Strong E&P Spending as Business Cycle Matures, July 2011 \(134529\)](#)
- » [North American Midstream Sector: Strong Oil and NGL Prices Boost Sector, While Demand for New Infrastructure Picks Up, March 2011 \(132003\)](#)

### Rating Methodologies:

- » Global Oilfield Services, December 2009 (121846)
- » Global Midstream Energy, December 2010 (128994)
- » Global Refining and Marketing Industry, December 2009 (121754)
- » Global Integrated Oil & Gas Industry, November 2009 (121399)
- » Government Related Issuers: Methodology Update (July 2010)

*Note that these references are current as of the date of publication of this report and that more recent reports may become available.*

To access any of these reports, click on the entry above. Note that these references are current as of the date of publication of this report and that more recent reports may be available. All research may not be available to all clients.

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