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What A Carbon-Constrained Future Could Mean For Oil Companies' Creditworthiness

Primary Credit Analysts:

Simon Redmond, London (44) 20-7176-3683; simon_redmond@standardandpoors.com

Michael Wilkins, London (44) 20-7176-3528; mike_wilkins@standardandpoors.com

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What A Carbon-Constrained Future Could Mean For Oil Companies' Creditworthiness

(Editor's Note: As part of Standard and Poor's Ratings Services efforts to align corporate credit analysis and climate change risk, we have undertaken a collaborative study with Carbon Tracker, a non-profit think tank. The study looks at how climate change risk might affect a sample of our rated oil companies, and is a response to investors' growing interest in understanding the implications of potential future carbon constraints on the oil sector.)

The regulation of greenhouse gas (GHG) emissions is currently a patchwork of regional measures. Brent crude oil prices have remained strong at about \$110 per barrel (bbl) in recent years, but analysts are split on whether this price could drop or rise to more than \$150. Meanwhile, operational costs are rising for the oil and gas sector as finding and exploiting oil reserves becomes more difficult and companies' exposure to unconventional technology and hostile environments grows.

The latest and widely accepted scientific research on climate change suggests the future cannot resemble the past. Global energy use and the resulting emissions may have to change or we will have to adapt to a warmer world; arguably, it's likely we will need to do both. As a consequence, financial models that are based on past performance and creditworthiness may not be relevant in the future.

Overview

- The financial models that use past performance and creditworthiness may be insufficient to guide investors looking to understand the possible effects of future carbon constraints on the oil sector.
- To better integrate climate change risk and credit analysis, we have undertaken a study with Carbon Tracker to assess the implications of such risk on moderately sized, independent, unconventional oil companies and major oil and gas producers.
- The results show that for the smaller companies, we see a deterioration in the financial risk profiles of these companies to a degree that would potentially lead to negative outlook revisions and then downgrades over 2014-2017.
- The effect on the majors would be more muted, and we project that they would likely remain consistent with metrics we consider commensurate with their respective ratings until 2016-2017.

At an international level, the United Nations Framework Convention on Climate Change (UNFCCC) negotiations have delivered a clear objective to limit global warming due to human induced emissions to two degrees Celsius (2DegC). The policy response across the world has so far taken the form of a patchwork of national and regional regulation on emissions. A recent review of climate and energy legislation showed that 32 out of 33 major economies have taken action in some form (see note 1). Governments worldwide have introduced a range of mechanisms, such as emissions trading schemes, carbon taxes, and emissions intensity targets, many using the Kyoto Protocol--the international climate change treaty that determines the emissions reductions of each country.

Policy actions to moderate climate change also demonstrate that the future of fossil fuels cannot be determined purely by a carbon price. In Europe, feed-in tariffs (that is, top-up market subsidies for renewable energy producers)

determine the competitiveness of renewable energy sources such as wind and solar power, while the market-based carbon price casts doubt over the viability of new coal plants. In the U.S., there is no federal carbon market, but there are requirements on corporate average fuel efficiency (CAFE) standards, new restrictions on mercury emissions (under the Clean Air Act), and state-level measures on carbon emissions (in California, for example), while shale gas is shifting the power generation mix. In countries such as China, India, and Australia, the availability of water acts as a constraint on operations. As a consequence, investors are seeking information that looks beyond a simple carbon price to understand their range of future strategies.

North America Provides A Key Test Environment For Our Study

A report issued by Carbon Tracker (see note 2) highlights the risks to oil companies' reserves globally. Our research study with Carbon Tracker focuses on North America, largely because we believe it's a region where there's a high cost base in terms of development costs for oil sands and one of the areas with the greatest potential to reduce demand. Here, as elsewhere, oil is primarily used to produce transport fuels, and the U.S. has an ongoing policy to try and reduce its dependence on OPEC oil imports. Canada, with its vast unconventional oil sands reserves and increasing production, could offer an alternative, but at present there are no easy exports routes from the oil sands in Alberta. However, the proposed Keystone XL pipeline, which would potentially link Alberta to Texas and global markets, is again under consideration by the U.S. government.

Meanwhile, the re-election of Barack Obama as U.S. President, the Republicans' control of the Senate, and the appointment of John Kerry as Secretary of State set the political context for further potential action on GHG emissions. The U.S. Clean Air Act provides a mechanism by which emissions can be regulated by the Environmental Protection Agency (EPA), without legislation having to pass through the Senate. In terms of future long-term hydrocarbon demand, the International Energy Agency's (IEA's) 450 scenario, which aims to limit the global increase in temperature to 2DegC by limiting GHG emissions to 450 parts per million (ppm) of carbon dioxide (CO₂), sees a 35% reduction in oil use for transport by 2030, and 49% by 2035. This is beyond our immediate credit rating horizon, but does encompass the duration of some of the bonds issued by companies active in oil sands operations.

Pressure grows for emissions reductions and improved vehicle economy standards

The Energy Independence Act of 2007 covers a number of relevant areas, including expanding the production of renewable fuels, reducing U.S. dependence on oil, increasing energy security, and addressing climate change. It sets a mandatory Renewable Fuel Standard that requires fuel producers to use at least 36 billion gallons of biofuels by 2022, and provides incentives for the development of renewable energy technologies (solar, wind, geothermal, oceanic, biomass, and landfill gas).

The average fuel economy of vehicles (passenger cars and light trucks) sold in the U.S. in 2011 was 29 miles per gallon. An agreement has established a standard for automakers of 35.5 miles per gallon by 2016. This has been augmented by 2012 regulations that set a target average new vehicle economy of 56.5 miles per gallon by 2025. The U.S. Department of Transportation estimates this measure alone will reduce oil consumption by more than 2 million barrels of oil per day or 0.7 billion barrels a year by 2025. U.S. oil consumption peaked at around 7.6 billion barrels per year in 2005, dropping to 6.9 billion barrels in 2011.

The EPA has also issued standards for heavy trucks that reduce average on-road fuel consumption by 18% between 2014 and 2018. The Energy Policy Act of 2005 provides tax breaks of \$1.3 billion for alternative motor vehicles and fuels (ethanol, methane, liquefied natural gas, and propane), and provides a tax credit of up to \$3,400 for hybrid vehicle owners. There is also legislation that directs significant federal expenditure toward achieving targets on emission reductions and the composition of vehicle fleets.

Addressing The Gap Between Climate Change Policy And Capital Investments

The IEA has been integrating climate change policy scenarios into its thinking in recent years. Its most recent World Energy Outlook 2012 (see note 3) concluded that "...without a significant deployment of CCS (carbon capture and storage), more than two-thirds of current proven fossil-fuel reserves cannot be commercialized in a 2DegC world before 2050." This illustrates to us the apparent divergence between the assets owned by coal, oil, and gas companies and the direction of negotiations at UNFCCC conferences.

The gap between policymakers' ambitions and capital deployment can be shown to produce an increasing range of potential outcomes for the oil and gas sector. The IEA scenarios reflect the potential for significant changes to the operating environment post-2020. While 2020 may seem a long way out, it is pertinent for the capital expenditure strategies of companies bringing new assets on stream.

Our research study is designed to show the benefit of stress-testing underlying assumptions. Any methodology to assess an alternative scenario has to make assumptions on certain variables. The output serves as an illustration by indicating the effects of one scenario, but it does not indicate the range of other potential outcomes.

In the case studies that we reference, different assumptions were used about the prevailing oil price, and ultimately the related production levels. This reflects the potential implications of a scenario where fossil-fuel use reaches a plateau and then declines. Instead of considering issues of peak oil in terms of supply, this introduces a concept of peak oil demand.

The Implications Of Our Study Findings For Credit Ratings

In determining the credit rating on a company, we consider both its business and financial risk profiles. The joint research between Standard & Poor's and Carbon Tracker on oil reserves is compatible with this approach, because links can be made to the likely cash flows from existing reserves and to the investment strategy for developing more reserves in the future.

Our study considers two different types of company as case studies: moderately sized oil and gas companies with high exposure to Canadian oil sands and other unconventional fossil-fuel activities; and oil majors with increasing exposure to these kinds of carbon and water-intensive fossil fuels.

Under our stressed scenario, the ratings on companies with high development and production costs, including those focused on unconventional resources, could see rating pressure build within one or two years, especially if the companies are relatively undiversified. As for the integrated oil majors, we anticipate that the benefits of diversification

would dilute the adverse financial effects of lower oil prices under this stressed scenario in the near term.

Over five years or more, under our assumed stress scenario, the impact of reduced oil demand, potentially lower profitability, and declining reserve replacement would likely weigh on our business risk profile assessments of the companies under review (see text box). Their financial risk profiles would also be affected as debt coverage measures decline.

If this scenario materialized, the speed with which companies reacted and modified their strategies and financial policies (in terms of both investments and shareholder distributions) would be important. Indeed, such factors would in our view likely become potential differentiating rating considerations.

Standard & Poor's Use Of Oil And Gas Reserves In Credit Ratings

When assessing the creditworthiness of an oil and gas company, Standard & Poor's views reserves and production as one of two Category One rating factors (as defined in "Key Credit Factors: Global Criteria For Rating The Oil And Gas Exploration And Production Industry," published Jan.20, 2012, on Ratings Direct on the Global Credit Portal), the other being financial condition. The former includes the assessment of a company's:

- Scale.
- Product mix.
- Reserve life, track record of production growth and reserve replacement, future growth prospects, and mix of developed versus undeveloped reserves.
- Geographic diversity and country risk.

We typically focus on proven (1P) reserves, as defined by the U.S. Securities and Exchange Commission. These have been assessed by the companies or independent firms to have an approximately 90% chance of being produced economically. Key indicators for our assessment of reserves include absolute reserve levels, reserve replacement ratios, and the reserve life index (RLI, reserves divided by annual production). They also include the production mix of oil and gas, basis differentials (local prices compared with benchmarks), and growth prospects.

Also important is a company's cost position compared with peers, which we class as a Category Two rating factor. Costs for exploration and production (E&P) companies can be split into upfront finding and developing costs, and production-related expenses that include lifting cost and royalties. Collectively, these are termed all-in costs and are assessed on a per barrel basis. Our analysis factors in the absolute level in relation to price realizations, the relative levels comparing operators, and the balance between upfront and ongoing costs by type of reserves and location. We note that ongoing costs to sustain production are typically only a portion of the all-in costs.

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Stress Scenario Envisages A Progressive Decline In Oil Price Realizations

To assess the potential effect of policies consistent with the IEA's 450 ppm scenario, we have incorporated a lower demand outlook for oil products in our individual company forecasts through a resultant drop in oil prices. We've then considered the potential effect on our business and financial risk profile assessments, and hence the possible rating implications under the assumed lower demand scenario. Our assessment of the scenario's effect on companies' business risk profiles is mostly qualitative, while that on the financial risk profiles is largely quantitative in terms of the

resulting credit measures.

One important consideration from a rating perspective is the timeframe that we apply to our ratings and outlooks. Our investment-grade ratings (that is, those of 'BBB-' and above) are typically intended to have a time horizon of three to five years and the outlook could indicate an alternative scenario and roughly one-in-three chance of the rating changing in the next two to three years. For our speculative-grade ratings ('BB+' and below), the time horizons are shorter, with a rating horizon over two to three years and an outlook closer to one year.

The key input for our financial modeling of the lower oil demand in our stress scenario is a progressive decline in oil price realizations beyond the price deck assumptions in our existing rating base case (see Appendix). This reflects our assumptions regarding the effect of:

- Various policies globally that together reduce demand for crude oil and oil products; and
- Maintained production levels for existing developed and producing reserves. We estimate that the majority of these developed proven reserves are still economically viable (that is, above their operating breakeven levels, excluding finding and developing costs and investment).

As a consequence, our stress scenario takes into account a declining trend in oil prices from current levels to a floor for Brent crude of \$65 per bbl by 2017. We recognize that there is a degree of arbitrariness in these assumptions, both in terms of the rate of price decline and the medium to long term stressed price levels. We believe such a set of assumptions reflects a world in which near-term production is largely unaffected, and current projects continue to be developed. However, decisions regarding new investments would need to be considered in the light of lower oil price planning assumptions. Reduced development of existing reserves and resources would thus result in both declining proven reserve replacement and lower medium-term capital investment, as well as lower (and likely declining) overall production. The latter could then, in the medium to long term, provide some support to prices. We've not explicitly factored into our stress scenario any mitigating measures such as carbon sequestration or material cuts in near-term capital investment.

Study Sample Covers Both Oil Sands Companies And Conventional Oil Producers

For our study, we selected three Canadian companies that focus on unconventional oil production -- Canadian Oil Sands Ltd. (COSL), Canadian Natural Resources Ltd. (CNRL), and Cenovus Energy Inc. (see table). We also selected two international oil major, or integrated, companies (that is, large companies with both upstream and downstream assets) -- BP PLC and Royal Dutch Shell PLC.

Under our hypothetical stress scenario, we calculate the following effects on these companies' business and financial risk profiles:

Canadian unconventional oil producers COSL, CNRL, and Cenovus

Business risk assessments. Our existing business risk profile assessments on these companies are "satisfactory," as our criteria define the term, reflecting the good visibility on current production and long-lived reserves with little perceived development and geological risk.

Under our stress scenario we see a limited risk of reported reserve revisions in the very near term, for three reasons: First, the marginal cost of producing developed reserves should still be covered by our assumed price scenario. Second, under our criteria we include both proven and probable (1P and 2P) reserves for oil sands companies (for more details, see "Canadian Oil Sands Projects: How We Rate Them, And Why," published March 17, 2011). Third, we believe ongoing and imminent new phases would probably start to be developed. That said, low or insufficient replacement of developed reserves would likely put pressure on these companies' business risk profiles over the medium to long term. We note that under a meaningfully lower long-term oil price, the commercial viability of undeveloped reserves and hence the core business model could come into question unless development costs also fall. This could potentially result in a downgrade of more than one notch if we were to place less reliance on undeveloped or probable reserves than at present.

Financial risk assessments. We see a deterioration in credit measures for these smaller oil companies over 2014-2015, to a degree that could potentially lead to negative outlook revisions and downgrades over 2014-2017. Specifically, credit metrics could become inconsistent with our rating guidance if capital investment were to continue unchanged for more than a year or two under the stress scenario price assumptions. For all three companies, we see leverage increasing to take debt to EBITDA over 2.5x, which would be out of line with our current rating base case. The actual effect could be mitigated by a slowdown or cancellation of ongoing investments, although this could result in an earlier deterioration in our business risk profile assessments.

Oil majors BP and Royal Dutch Shell

Business risk assessments. The effect of the stress scenario on the business risk profiles of the oil majors is more muted than in the case of the unconventional oil producers. This is because the majors benefit from diversification across geographies, production, and technologies. We note however, that weakening demand would likely only worsen the already challenging outlook for downstream refining and potentially marketing businesses.

The companies' perception of, and strategic responses to, the deteriorating price environment would be important. In particular, we would need to assess their appetite for development of relatively high all-in cost reserves—including some oil sands and shale liquids resources—and hence downside scenarios, investment decisions, and reserve replacement. We recognize that annual reserve replacement measures are lumpy, and tend to assess them on a three-year average as well as an annual basis. The delay of final investment decisions and postponement of developments resulting in reserve replacement ratios (RRRs) below 100% for more than one year—excluding price effects—could, however, signal the start of a structural trend. Such an RRR outlook, including and excluding price changes, could in our opinion become a rating constraint, especially in the context of adequate but moderate proved developed reserve life index of about eight years for both companies today.

The long-term nature of many of the investment decisions already made, the relatively lower operating breakeven price levels for many of the more conventional developments, and all-in cost for some unconventional resources would provide a meaningful cushion in the coming years for these larger diversified companies, in our view. Some overall reassessment of our long-term industry outlook could, however, start to place additional pressures on companies' business risk profiles.

Financial risk assessments. The financial risk profiles of the oil majors would weaken modestly over the next five years under our stress scenario. We project that they would remain consistent with metrics we consider commensurate with the respective ratings on these companies for at least three years. With Brent at \$65 per bbl, \$15 per bbl below our

current long-term price assumption, credit measures would likely move outside the current ranges for the ratings. The actual effect would crucially depend on the assessment and financial strategies that the companies adopt to address their perception of the change in the environment and outlook. In particular, we would be mindful of their financial policies and free cash flow profiles (and hence debt increases) because we would likely place less reliance on future cash flows from relatively high-cost projects. Over the medium term, a moderation of capital investment could mitigate weaker operating cash flow, as a result of lower oil price realizations. The decisions taken with regard to shareholder distributions, acquisitions, and debt reduction under the stress scenario would, as now, be important rating considerations.

Key Business Indicators For Selected Oil Companies In The Standard & Poor's/Carbon Tracker Survey Of Climate Change Risk

Company	Canadian Oil Sands Ltd.	Canadian Natural Resources Ltd.	Cenovus Energy Inc.	BP PLC	Royal Dutch Shell PLC
Rating as of March 1, 2013	BBB/Stable/--	BBB+/Stable/--	BBB+/Stable/--	A/Positive/A-1	AA/Stable/A-1+
Business risk profile	Satisfactory	Satisfactory	Satisfactory	Strong	Excellent
Financial risk profile	Intermediate	Intermediate	Intermediate	Modest	Minimal
Company description	COSL is a top-tier oil sands producer, with all of its production derived from the Syncrude oil sands project	CNRL has a large exposure to oil sands development and production. The majority of its current and future production is derived from oil sands, but the company also has a meaningful exposure to gas, which provides some limited diversification	Cenovus is a large oil and gas company with significant steam-assisted gravity drainage (SAGD) oil sands, conventional liquids, and shallow gas assets	BP has a diverse portfolio of exploration and production (E&P) assets worldwide, as well as downstream assets. It has a majority of conventional reserves, but also a significant portfolio of unconventional projects	Shell's main activities are oil and gas E&P, including liquefied natural gas; refining; chemicals; and marketing. The majority of production comes from conventional reserves, but Shell also has a portfolio of unconventional projects including the Athabasca Canadian oil sands
Positive rating triggers	Debt to EBITDA <1x and sustained	Unlikely	Little near to medium term potential for an upgrade	FFO to debt >50% and sustained strong operating performance and safety track record	Dependent on a return to a more conservative balance sheet
Negative rating triggers	Fully adjusted debt to EBITDA >2.5x	Debt level to increase such that debt to EBITDA is >=2.5x	Fully adjusted debt to EBITDA >2.5x	If near-term Gulf of Mexico payments >\$20 billion, or if funds from operations (FFO) to debt <40%	If company returns to negative free cash flow after dividends, resulting in FFO to debt of <60% on a sustained basis
Proved reserves as of December 2011 (bil. boe)	0.8	4.0	1.9	17.7	14.3
Net proven and probable oil sands reserves in 2011 (bil. boe)	1.8	5.5	2.2	N.A.	1.7*
Production (boepd)	90	621	255	3,510	3,215
Proved, developed reserves/production (%)	25.9	12.0	6.2	7.7	8.1

*Proven reserves only. boe--barrels of oil equivalent. boepd--barrels of oil equivalent per day. N.A.--Not available.

Stress Model Shows That Rating Pressure Could Build If Conditions Persist

We have considered the rating implications of our stress scenario on the companies today and over the next 3-5 years. We have modeled on the basis of our 2012 price deck assumptions with a continued decline to a lower long-term oil price floor. Rating or outlook changes seem unlikely in the very near term because the scenario is not materially different from the current price deck assumptions. However, as the price declines persist in our stress scenario of weaker oil demand, meaningful pressure could build on ratings. First to be affected would be the relatively focused, higher cost producers, and then the more diversified integrated players. In both cases, according to our study, the causes would be a decline in operating cash flows, weakening free cash flow and credit measures, along with less certain returns on investment and less robust reserve replacement.

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Notes

1. The Climate Legislation Study (January 2013), GLOBE International and LSE Grantham Research Institute on Climate Change and the Environment. More details can be found at http://www.globeinternational.org/images/climate-study/3rd_GLOBE_Report.pdf
2. Unburnable Carbon – Are the world's financial markets carrying a carbon bubble? (July 2011), Carbon Tracker. More details can be found at <http://www.carbontracker.org/>
3. World Energy Outlook 2012 (November 2012), The International Energy Agency. More details can be found at <http://www.worldenergyoutlook.org/publications/weo-2012/>

Related Criteria And Research

All articles listed below are available on RatingsDirect on the Global Credit Portal, unless otherwise stated.

- Standard & Poor's Revises Its Oil And Natural Gas Liquids Price Assumptions; Natural Gas Price Assumptions Remain Unchanged, Feb. 11, 2013
- How Do Middle Eastern Sovereigns' Fiscal Breakeven Oil Prices Affect Credit Ratings and Oil Prices?, Feb. 1, 2013
- Canadian Oil And Gas Exploration And Production Companies: Some Key Credit Factors Analyzed, Nov. 28, 2012
- Key Credit Factors: Global Criteria For Rating The Oil And Gas Exploration And Production Industry, Jan. 20, 2012
- Canadian Oil Sands Projects: How We Rate Them, And Why, March 17, 2011

APPENDIX: Assumptions Behind The Standard & Poor's/Carbon Tracker Oil Stress Scenario

Our hypothetical stress scenario makes the following assumptions:

- A series of global, national, and local policy actions aimed at moderating CO2 emissions and reducing demand for hydrocarbon products and crude oil.
- Broadly maintained oil production in the next few years as producers maximize their returns from existing developed resources that remain commercially viable. This implicitly assumes that members of OPEC also fail to rein back exports materially.
- Oil prices fall to a Brent crude oil floor price of \$65 per bbl by 2017. We currently use a long-term \$5 per bbl discount for West Texas Intermediate (WTI) crude, compared with Brent crude, for our ratings on exploration and production (E&P) companies. We typically use a further discount of 20%-30% between WTI crude and Canadian heavy crude benchmarks such as Western Canada Select (WCS). We note that the effect on price realizations for producing assets with limited transportation and export routes and options can be accentuated, as seen for WTI crude in 2011 and 2012.
- In the near term, oil producers broadly continue to invest capital in ongoing new and production-enhancing projects, and those for which final investment decisions (FIDs) have already been taken. These developments support crude supply in the near to medium term.
- E&P capital investment begins to moderate after two to three years as oil majors and independent companies use lower future oil price planning assumptions, and projects with higher all-in development costs are postponed. The latter could include additional investment phases for Canadian oil sands companies.
- We moderate or cut dividend distributions where declining operating cash flow levels are insufficient to cover capital investment and previous dividend levels.
- Limited declines, excluding price effects, in companies' reported reserves in the next two to three years as oil prices decline. This reflects our understanding that in the next year or two, FIDs would continue to be taken on the basis of the current high oil price outlook; and that at present, most developed producing reserves are still economic at lower-than-prevailing oil prices. The latter reflects both that the marginal costs of production are materially below \$90 per bbl and also that oil price expectations were meaningfully lower when FIDs were taken on currently producing reserves.

Additional Contact:

Industrial Ratings Europe; CorporateFinanceEurope@standardandpoors.com

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