



CanOils

An **Evaluate** Energy Service

How Sustainable is Canadian Oil & Gas at \$50 per Barrel?



The Strongest and Weakest Companies Compared

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This study takes 50 of Canada’s biggest oil and gas companies and shows how well placed Canadian oil and gas is to deal with the current oil price drop and how vulnerable the industry really is.

To do this, the study takes 3 notional WTI spot prices (US\$90, US\$60 and US\$50) and uses company data over the past two years to estimate a notional revenue per barrel for each company at each given benchmark price environment.

This is then compared to 3 different break even measures, **cash costs**, **accounting costs** and **full**

cycle costs; the full definitions of these cost measures can be found on page 13 of this study. Debt and hedging positions are also taken into account to provide you with a **comprehensive overview of how healthy Canadian oil and gas is at US\$50 oil.**

The full list of companies (“the peer group”) included in the report and why they were chosen is on page 12, whilst all assumptions made in the study are detailed on page 16. Those companies in the group that produce more oil than gas (over 50% of total boe) are referred to as the “**oil producers**” and the remainder are the “**gas producers**”.

All data in the study, unless otherwise stated, can be sourced or calculated using data available to subscribers of the CanOils database service.

Executive Summary

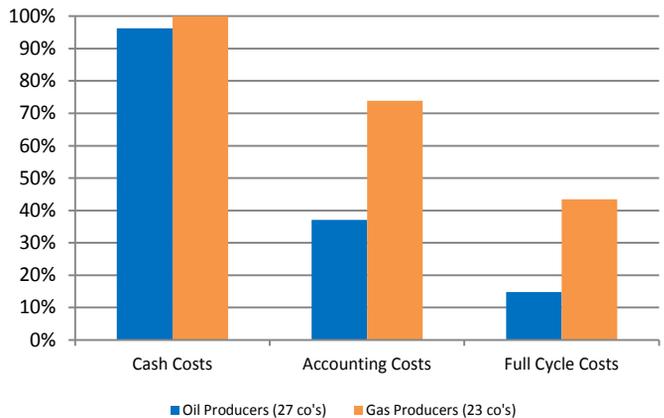
The Canadian oil and gas industry, as in every other country around the world, has been shaken by the continuing sharp decline in oil prices, with market capitalization values for nearly all oil and gas companies falling dramatically. The widely accepted benchmark spot oil price in North America, West Texas Intermediate (WTI) was still over US\$90 in September 2014, but by January 2015, it had fallen to around US\$50.

This dramatic fall in price has resulted in Canadian oil and gas companies' current operations appearing unsustainable long-term. However, the cost analysis model in this CanOils study shows that operations can continue in the short-term, with little or no incentive for Canadian companies to cut production just yet.

Key Conclusions of this CanOils Study

- 1) Less than 20% of leading Canadian oil and gas companies with oil-weighted production will be able to sustain their business long-term at US\$50 a barrel. The longer that benchmark prices stay this low, the quicker and deeper the decline in expenditures on exploration and new development – and consequently on Canadian oil production – will be. Externally-sourced finance for development could also be limited; the inevitable writedowns of assets that will accompany the falling oil price could harm companies' ability to borrow based on their reserves going forward and low share prices may discourage companies from securing finance by issuing equity.
- 2) In the immediate future, however, expect the opposite; companies will aim to maximise output from existing facilities and squeeze every last drop of oil from existing wells. That is because virtually all Canadian oil and gas producers (including oil sands producers) should continue to generate positive cash flow at US\$50 oil. Trouble is, it's not sustainable.

% of Oil & Gas Producers That Can Cover Each Cost at US\$50 WTI



WTI Spot Price (US\$ - Source: EIA)



- 3) A significant number of companies with high debt ratios are particularly vulnerable right now.
- 4) Natural gas-weighted producers' profits will be substantially shielded from the effects of the drop in oil prices, assuming gas prices hold up.
- 5) Expect to see more M&A activity as companies with the most liquidity upgrade their portfolios.

Full definitions of costs used in this study are available on page 13.

Introduction: Crashing Market Capitalization Values

The peer group has seen a dramatic decline in market cap. since the end of the third quarter 2014. At the end of September 2014, with WTI spot prices still above US\$90, the group had a combined market cap of around Cdn\$151 billion. As of mid-December however, with the WTI spot price dramatically falling by a third to around US\$60 (and 2015 futures falling to around US\$50), this total fell by a staggering Cdn\$66 billion to just over Cdn\$84 billion.

The market has so far proved a brutal environment for the peer group at this lower oil price; every one of the companies has suffered a fall in market cap. between the end of September 2014 and mid-December 2014 – the weighted average fall across the entire group was 50%.

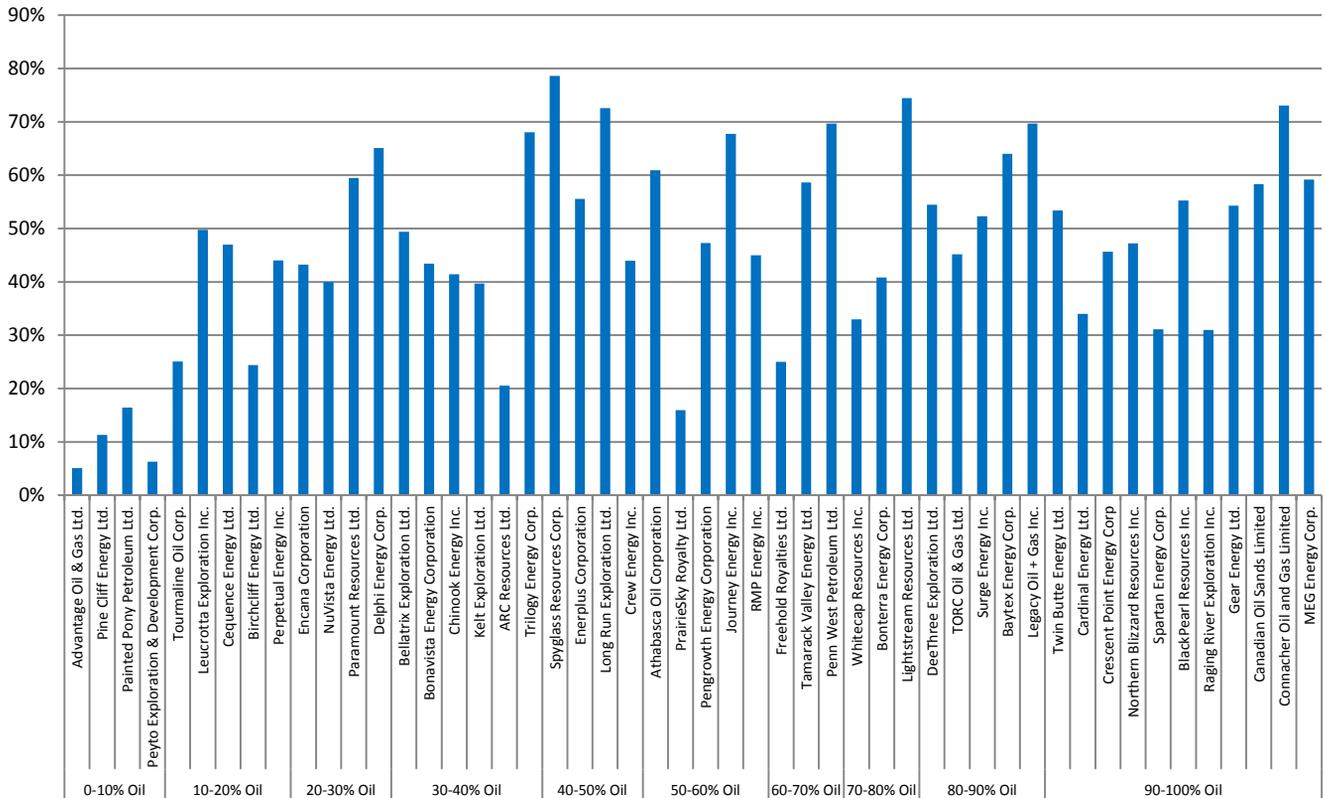
WTI Spot Price (US\$ - Source: EIA)



Company Name	Mkt Cap Sep 30 (Cdn\$000s)	Mkt Cap Dec 15 (Cdn\$000s)	% Fall	Company Name	Mkt Cap Sep 30 (Cdn\$000s)	Mkt Cap Dec 15 (Cdn\$000s)	% Fall
Advantage Oil & Gas Ltd.	966,000	916,860	5%	Leucrotta Exploration Inc.	357,000	179,300	50%
ARC Resources Ltd.	9,392,000	7,460,000	21%	Lightstream Resources Ltd.	1,052,000	268,840	74%
Athabasca Oil Corp.	2,303,000	900,550	61%	Long Run Exploration Ltd.	869,000	238,000	73%
Baytex Energy Corp.	7,060,000	2,540,000	64%	MEG Energy Corp.	7,694,000	3,140,000	59%
Bellatrix Exploration Ltd.	1,317,000	666,910	49%	Northern Blizzard Resources Inc.	1,633,000	861,280	47%
Birchcliff Energy Ltd.	1,614,000	1,220,000	24%	NuVista Energy Ltd.	1,443,000	865,870	40%
BlackPearl Resources Inc.	705,000	315,500	55%	Painted Pony Petroleum Ltd.	1,181,000	986,860	16%
Bonavista Energy Corp.	2,616,000	1,480,000	43%	Paramount Resources Ltd.	6,711,000	2,720,000	59%
Bonterra Energy Corp.	1,824,000	1,080,000	41%	Pengrowth Energy Corp.	3,112,000	1,640,000	47%
Canadian Oil Sands Ltd.	10,012,000	4,170,000	58%	Penn West Petroleum Ltd.	3,757,000	1,140,000	70%
Cardinal Energy Ltd.	1,066,000	703,420	34%	Perpetual Energy Inc.	263,000	147,010	44%
Cequence Energy Ltd.	386,000	204,700	47%	Peyto Expl. & Dev. Corp.	5,431,000	5,090,000	6%
Chinook Energy Inc.	441,000	258,100	41%	Pine Cliff Energy Ltd.	489,000	362,370	11%
Connacher Oil and Gas Ltd.	59,000	15,850	73%	PrairieSky Royalty Ltd.	4,583,000	3,850,000	16%
Crescent Point Energy Corp.	17,923,000	9,740,000	46%	Raging River Exploration Inc.	1,653,000	1,140,000	31%
Crew Energy Inc.	1,220,000	683,660	44%	RMP Energy Inc.	839,000	461,640	45%
DeeThree Exploration Ltd.	808,000	367,800	55%	Spartan Energy Corp.	932,000	642,150	31%
Delphi Energy Corp.	556,000	194,300	65%	Spyglass Resources Corp.	177,000	37,780	79%
Encana Corp.	17,681,000	10,030,000	43%	Surge Energy Inc.	1,559,000	743,790	52%
Enerplus Corp.	4,367,000	1,940,000	56%	Tamarack Valley Energy Ltd.	513,000	212,320	59%
Freehold Royalties Ltd.	1,720,000	1,290,000	25%	TORC Oil & Gas Ltd.	1,216,000	666,700	45%
Gear Energy Ltd.	339,000	155,090	54%	Tourmaline Oil Corp.	10,009,000	7,500,000	25%
Journey Energy Inc.	388,000	124,910	68%	Trilogy Energy Corp.	3,190,000	1,020,000	68%
Kelt Exploration Ltd.	1,521,000	917,500	40%	Twin Butte Energy Ltd.	570,000	265,990	53%
Legacy Oil + Gas Inc.	1,224,000	371,500	70%	Whitecap Resources Inc.	3,939,000	2,640,000	33%

Introduction: No Reprieve For Gas Producers So Far

% Fall in Market Cap between 30 Sept. 2014 and 15 Dec. 2014



The market has also shown no regard for each company's individual oil and gas production portfolio; gas producers' market cap. values have deteriorated just as much as the oil producers, despite the gas price staying above Cdn\$4.00 after a recent climb – the AECO benchmark was averaging at around Cdn\$4.30 by the end of Q3 2014, having been below Cdn\$3.00 in 2013 – and not falling like WTI. The above chart shows the percentage fall in market cap. for all 50 companies in the peer group. The companies are ordered from left to right in terms of how much of their portfolio is made up of oil.

There is a very weak correlation in the chart if there is any correlation at all. The first four companies in the chart (less than 10% oil production) have seen small percentage drops in their market cap. values since September – all values falling by less than 20%. But

from then on, it's impossible to see any reprieve afforded to the more heavily gas-weighted companies by the market; every one of the companies is being tarred with the same brush.

This probably shouldn't be expected to continue for very long; the combination of a falling oil price and a steady gas price should result in gas-weighted companies being largely unaffected both financially and operationally and they should see at least some recovery in their market cap. before too long. For the oil-weighted companies however, the continuing fall in price will remain a roadblock at the very least. How much of a roadblock it eventually proves to be will depend on how well each company is positioned to deal with such a dramatic fall in price and how sustainable their production is.

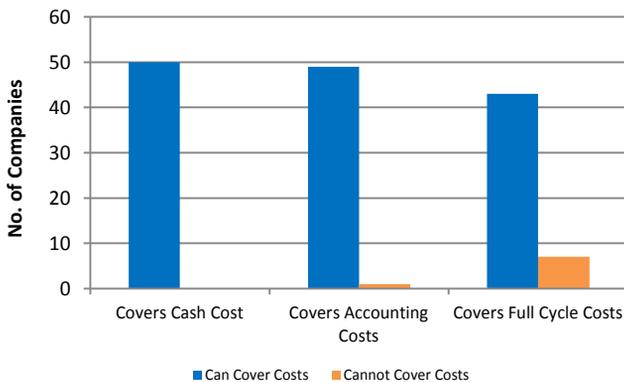
September 2014: US\$90 Oil

At the end of September 2014, the WTI spot oil price was still above US\$90.

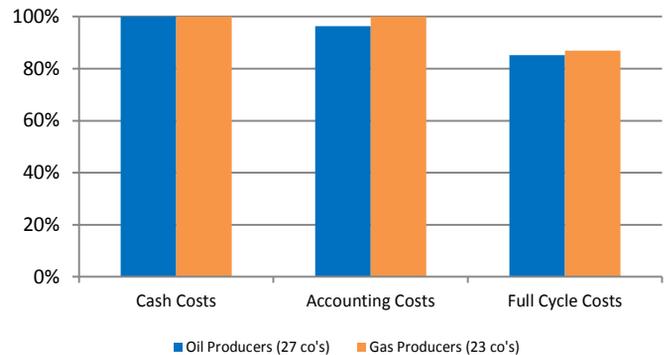
Average Revenue per Barrel vs. Various Cost Levels at US\$90 WTI

Category	Revenue per Barrel	vs. Cash Costs	vs. Accounting Costs	vs. Full Cycle Costs
Whole Peer Group	Cdn\$56.87	+Cdn\$39.08	+Cdn\$19.79	+Cdn\$9.79
Oil Producers	Cdn\$70.05	+Cdn\$48.66	+Cdn\$25.34	+Cdn\$12.08
Gas Producers	Cdn\$41.40	+Cdn\$27.84	+Cdn\$13.27	+Cdn\$7.10

How Many Companies Cannot Cover Costs at US\$90 WTI?



% of Oil & Gas Producers That Can Cover Each Cost at US\$90 WTI



At US\$90 oil, the whole peer group, oil and gas companies alike, is very healthy on average. All companies can cover their cash costs, only one company looks to be struggling in terms of its average accounting costs and less than 10 of the 50 companies are struggling to cover full cycle costs. These would be companies looking to perhaps divest assets, undergoing full scale reviews of their operations, having been caught in high cost environments. Being caught in this kind of situation can happen to any company, regardless of how much oil or gas they produce, which explains why the oil and gas producing peer groups are performing to the same level – roughly 80% of both the oil producers and the gas producers can cover their full cycle costs at US\$90 oil.

However, if the oil price begins to drop, the oil producers start to fare rather worse on average than their gas producing counterparts – Remember, if existing cash costs are covered, there is little or no incentive for any company to cut existing production, regardless of their portfolio make-up. If accounting costs are covered, action is even less likely in the short term, as shareholders will probably be happy to carry on as before, hoping the price will rebound.

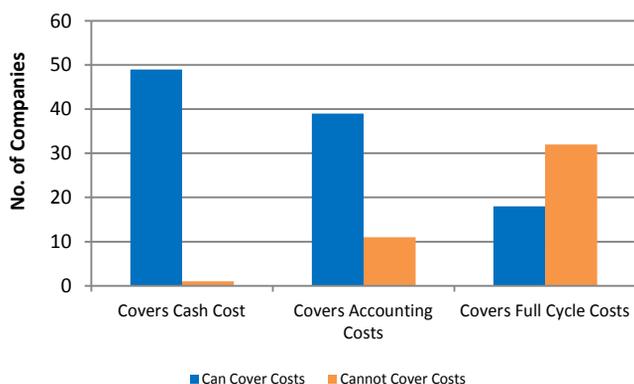
December 2014: US\$60 Oil

By mid-December 2014, the WTI spot oil price had fallen to around US\$60.

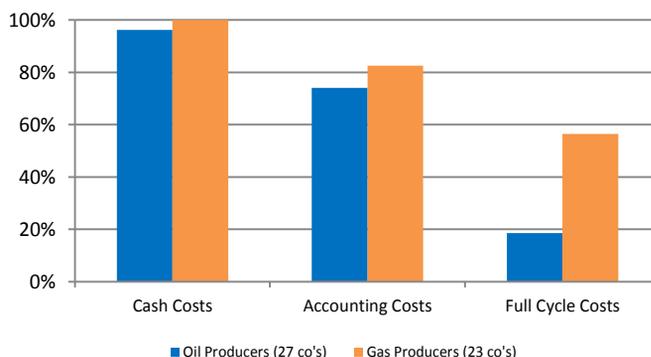
Average Revenue per Barrel vs. Various Cost Levels at US\$60 WTI

Category	Revenue per Barrel	vs. Cash Costs	vs. Accounting Costs	vs. Full Cycle Costs
Whole Peer Group	Cdn\$42.11	+Cdn\$24.32	+Cdn\$5.03	-Cdn\$4.97
Oil Producers	Cdn\$48.47	+Cdn\$27.07	+Cdn\$3.75	-Cdn\$9.50
Gas Producers	Cdn\$34.65	+Cdn\$21.09	+Cdn\$6.52	+Cdn\$0.36

How Many Companies Cannot Cover Costs at US\$60 WTI?



% of Oil & Gas Producers That Can Cover Each Cost at US\$60 WTI



At US\$60 oil, with the simple assumptions that all other variables remain constant (see page 15), the peer group is still reasonably healthy as a whole. The group seems to be firmly in control of cash costs – the group revenue per barrel averages nearly Cdn\$25 above average cash costs – and accounting costs are still covered by ~80% of all companies. So at US\$60 oil there is little incentive to cut production, dividends or undertake any drastic portfolio assessments based on pure upstream revenues and costs alone. Of course, debt may have a role to play outside of these pure upstream expenses, but on its own, US\$60 oil will not cause any great shake up to the Canadian oil and gas industry in the short-term.

Full cycle costs are affected at US\$60 however, and the current state of Canadian oil and gas does not look sustainable long-term. This is especially true for oil producers. At US\$60 oil, whilst over 75% of the oil

producers cover accounting costs, full cycle costs are covered by less than 20% of the companies. Gas producers are much healthier, as over half can still cover their full cycle costs. In this very simple model, the data suggests that US\$60 oil and Cdn\$4.30 gas is around the break even point for sustainable operations for the gas producers, with average full cycle costs almost identical to revenues for the gas producers.

With full cycle costs not being covered, the oil producers of the peer group will be hoping for a rebound in prices before too long, as if things were to remain constant at US\$60 for a prolonged period of time, oil producing companies cannot expect any funds for future growth.

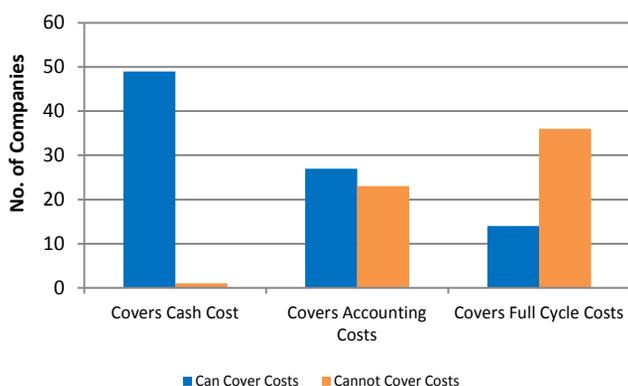
January 2015: US\$50 Oil

WTI spot prices fell to around US\$50 in early January 2015.

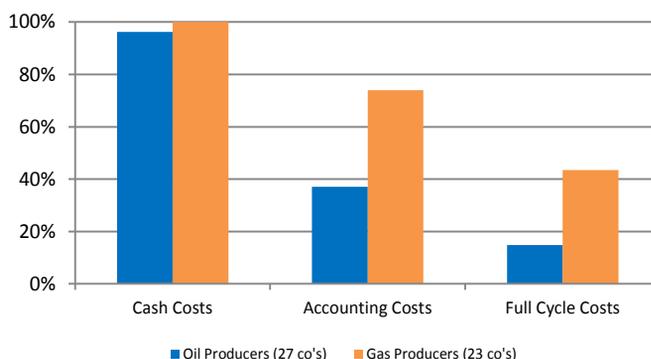
Average Revenue per Barrel vs. Various Cost Levels at US\$50 WTI

Category	Revenue per Barrel	vs. Cash Costs	vs. Accounting Costs	vs. Full Cycle Costs
Whole Peer Group	Cdn\$37.19	+Cdn\$19.40	+Cdn\$0.10	-Cdn\$9.89
Oil Producers	Cdn\$41.27	+Cdn\$19.87	-Cdn\$3.44	-Cdn\$16.70
Gas Producers	Cdn\$32.40	+Cdn\$18.84	+Cdn\$4.27	-Cdn\$1.89

How Many Companies Cannot Cover Costs at US\$50 WTI?



% of Oil & Gas Producers That Can Cover Each Cost at US\$50 WTI



Perhaps unsurprisingly, at US\$50 oil, the oil producers are really squeezed; on average, the estimated revenue per barrel is actually less than the gas producers averaged at US\$90 oil. This will really hurt the oil producers as operating costs for oil producing assets are much higher than for gas producing assets. This is borne out in the data; as the second chart clearly shows, whilst cash costs are still very well covered for both oil and gas producers, only around a fifth of the oil producers can cover their full cycle costs. Canadian oil production, on the whole, appears unsustainable in the long run at US\$50, much like it did at US\$60.

Gas producers again are relatively stable; over half of the peer group appears sustainable at US\$50, even though average full cycle costs are slightly higher than revenues per barrel.

The main difference between the oil producers' cost metrics at US\$50 compared to those at US\$60 is that the **accounting cost** becomes more of an issue. More companies will be in real danger of deficits on their annual and quarterly financial statements and this in turn will lead to negative earnings per share amounts, resulting in greater discontent for shareholders.

This was not really the case at US\$60, but at US\$50, action may need to be taken by oil producers to keep the shareholders on side. As there is no real incentive to cut existing production (existing cash costs are covered), this action may include selling assets, suspending drilling or adjusting capital spending budgets. If oil continues to fall in price, it is likely that a lot of **prospective oil assets**, rather than currently producing assets, will hit the market first.

Which Companies are Most Exposed by High Debt?

Q3 2014 – Debt Metrics for Oil Producers (Ranked on Debt-to-Capital Ratio)

	Q3 Production (boe/d)	% Production (Oil)	Debt-to-Capital Ratio	Total Debt as % of Equity
Connacher Oil and Gas Ltd.	14,163	100.00%	90.60%	966.60%
MEG Energy Corp.	76,471	100.00%	46.30%	86.20%
Lightstream Resources Ltd.	38,837	77.80%	42.20%	73.10%
Baytex Energy Corp.	94,093	85.20%	41.30%	70.30%
Twin Butte Energy Ltd.	20,981	90.20%	39.10%	64.20%
Pengrowth Energy Corp.	72,472	53.80%	33.10%	49.40%
Legacy Oil + Gas Inc.	25,004	88.20%	30.10%	43.00%
Gear Energy Ltd.	6,712	97.30%	29.50%	41.80%
Canadian Oil Sands Ltd.	87,787	100.00%	28.80%	40.50%
Surge Energy Inc.	20,327	84.50%	27.50%	38.00%
Northern Blizzard Resources Inc.	20,279	94.10%	24.50%	32.50%
Whitecap Resources Inc.	34,940	71.60%	23.70%	31.00%
Freehold Royalties Ltd.	9,430	62.20%	23.70%	31.00%
Penn West Petroleum Ltd.	100,839	64.10%	22.80%	29.60%
Tamarack Valley Energy Ltd.	5,765	64.00%	22.70%	29.30%
Bonterra Energy Corp.	13,355	72.60%	21.60%	27.60%
RMP Energy Inc.	13,074	56.00%	21.60%	27.60%
Crescent Point Energy Corp.	141,183	91.00%	20.20%	25.40%
DeeThree Exploration Ltd.	12,294	81.80%	19.90%	24.80%
Athabasca Oil Corp.	6,381	51.30%	19.20%	23.70%
Journey Energy Inc.	11,002	54.90%	16.80%	20.20%
TORC Oil & Gas Ltd.	11,436	83.80%	12.90%	14.80%
Spartan Energy Corp.	7,399	94.40%	8.20%	9.00%
Cardinal Energy Ltd.	7,587	90.30%	7.90%	8.50%
Raging River Exploration Inc.	10,679	96.20%	6.10%	6.50%
PrairieSky Royalty Ltd.	15,448	52.40%	No Debt	No Debt
BlackPearl Resources Inc.	9,248	94.60%	No Debt	No Debt

As the study into the different costs shows, producing more gas than oil lends a lot of protection against a falling oil price by itself. So this section, which will be looking at the companies' debt-related data, focuses purely on the oil companies.

High debt means less flexibility. Whilst the pure upstream cost analysis suggested that an immediate cut in production is unnecessary even at US\$50 oil for most companies in the peer group, the companies with the highest debt will have fewer options available than they did at \$100 oil. For instance, in a position of high debt and therefore higher risk, a company is less likely to be able to cut down on drilling expenditures as increased production will be needed to generate cash for the interest payments.

As the table shows, Connacher Oil and Gas finds itself in a unique position with over 90% of its capital in Q3 2014 made up of debt. The rest of the group varies in

how much each company's plans are likely to be dictated and constrained by their debt positions, with many companies' debt-to-equity ratios hovering around the generally-considered healthy positions of 30-35% or below. The companies with debt-to-equity ratios of higher than 35% all produce a lot more oil than gas, suggesting that in a prolonged period of oil selling at around US\$90, a lot of finance was available in the form of debt to the highest % oil producers. A crash in oil prices may be leaving these companies with few alternatives to selling large portions of producing assets quickly.

As a cautionary note, the fall in prices will result in companies recording many writedowns in coming periods, which could harm the ability to borrow based on reserves going forward, whilst low share prices may discourage companies from securing finance via equity issuance; funding for development looks set to be limited across the board.

Which Companies are Best Protected through Hedging Contracts?

Q3 2014 - % Oil Production Hedged for Oil Producers (Ranked by % Oil Production Hedged)

	Q3 Production (boe/d)	% Production (Oil)	% Oil Production Hedged
Twin Butte Energy Ltd.	20,981	90.20%	136.26%
Northern Blizzard Resources Inc.	20,279	94.10%	112.70%
Whitecap Resources Inc.	34,940	71.60%	75.53%
Pengrowth Energy Corp.	72,472	53.80%	58.96%
Spartan Energy Corp.	7,399	94.40%	57.30%
Journey Energy Inc.	11,002	54.90%	54.64%
Surge Energy Inc.	20,327	84.50%	50.06%
Crescent Point Energy Corp.	141,183	91.00%	49.65%
Connacher Oil and Gas Ltd.	14,163	100.00%	49.42%
Lightstream Resources Ltd.	38,837	77.80%	46.35%
BlackPearl Resources Inc.	9,248	94.60%	45.75%
TORC Oil & Gas Ltd.	11,436	83.80%	44.33%
Cardinal Energy Ltd.	7,587	90.30%	40.88%
DeeThree Exploration Ltd.	12,294	81.80%	39.76%
Gear Energy Ltd.	6,712	97.30%	38.29%
Baytex Energy Corp.	94,093	85.20%	37.79%
Tamarack Valley Energy Ltd.	5,765	64.00%	32.54%
Legacy Oil + Gas Inc.	25,004	88.20%	26.97%
RMP Energy Inc.	13,074	56.00%	23.89%
Raging River Exploration Inc.	10,679	96.20%	21.89%
Penn West Petroleum Ltd.	100,839	64.10%	0.00%
Canadian Oil Sands Ltd.	87,787	100.00%	0.00%
MEG Energy Corp.	76,471	100.00%	0.00%
PrairieSky Royalty Ltd.	15,448	52.40%	0.00%
Bonterra Energy Corp.	13,355	72.60%	0.00%
Freehold Royalties Ltd.	9,430	62.20%	0.00%
Athabasca Oil Corp.	6,381	51.30%	0.00%

Again, this section will focus purely on the oil weighted companies of the peer group, as in a climate of a falling oil price, the gas producers are protected to some extent by their production portfolios.

CanOils' hedging data compares the amount of oil production in Q3 2014 that is covered by contracts active in Q4, as a measure of how secure a company's existing profits are, assuming all things except prices are equal and constant.

Hedging contracts are only relevant to this discussion because the oil price has dropped so dramatically; the companies with the highest hedging percentages in the table above will be enjoying a much higher price than their competition in Q4.

Being in this position could have numerous impacts on a company's immediate outlook in this current

climate. Firstly, a company could decide to sink its extra profits now in drilling, ensuring a greater level of production to maintain revenues in lower price environments going forward. Of course, this will have an increase in costs attached, so is an unlikely course of action in these uncertain times. R&D into cost efficiencies can also be paid for.

Another more likely approach will be to use the profit to pay off debt if necessary, lessening any need that may occur going forward to sell prospective assets; if prices do eventually rebound, oil assets will be sought after again. Looking at the data above and in the debt table on page 9, Twin Butte is a company that could be likely to take this approach; the company has a high debt-to-equity ratio at around 64%, but the entirety of its oil production appears covered by hedging contracts in Q4.

Conclusions

In short, a large part of the Canadian oil and gas industry does not appear sustainable at US\$50 WTI. Full cycle costs are not covered by most oil producers and half of the gas producers in this simple model, so things cannot continue as they are for very long if oil continues to drop in price towards and beyond the US\$50 mark.

However, the data has shown that whilst the falling price is undoubtedly a problem, it is not all doom and gloom. Even at US\$50 oil, over 95% of the 50 companies could cover their cash costs, meaning there is no real incentive to cut production from currently producing oil and gas wells. From a purely upstream costs-based standpoint, most of the 50 companies have time to be patient with planning their next moves. Of course, sustainable operations are what all of the companies will want to achieve, and what the majority of them had at US\$90 oil, but there is no need to panic just yet.

Adding current debt to the equation does change matters significantly for some of the more debt-heavy companies, but on the whole the peer group seems healthy. The companies are in fact slightly healthier in terms of pure costs than this study suggests; the study has inherently inflated costs at both the US\$60 and US\$50 oil marks as the oil price is the only changing variable. Production taxes will fall and production costs are likely to fall alongside the oil price, with suppliers being squeezed on price to retain contracts with their upstream customers, for example.

Therefore, whilst operations appear unsustainable long-term, the impact of the falling oil price on the onstream operations of the peer group in the very short-term is in fact quite minimal. Companies will begin to release rhetoric stating how they are now refocusing on streamlining operations and getting back to the cores of their original business plans; capital spending on exploration will be reduced and some development projects will be delayed. In some

cases, dividends may also be cut. Deals for more exploration or early-development stage oil assets should also be expected.

Further cost efficiencies will also be sought after in many cases; actual cash for R&D may be short in a climate of prolonged low oil prices, but plans to increase cost-effectiveness of operations will be of paramount importance. In fact, one of the most likely outcomes of the drop in oil price is that, if the price does eventually rebound, operators will be in a far better position to enjoy the upside.

This period of falling oil prices will undoubtedly be a challenge for all companies in the peer group, especially for those most reliant on oil for their revenues and those with the highest debt. Low share prices may discourage companies from securing finance by issuing equity, whilst asset writedowns may harm the ability to borrow, so finance for future projects could be limited. But the majority of the companies are relatively healthy debt-wise, and nearly all companies are secure in their cash costs, so no drastic changes across the board are needed right away. Of course, a couple of the 50 companies may eventually fail, should the price never rebound or stay low for a prolonged period, but the peer group on the whole has time to take stock and plan carefully how best to approach these difficult times ahead.



Discover which companies are:

- 1) particularly well placed to weather the oil price storm
- 2) more vulnerable to the falling price

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Companies included in this Study

This study includes the 50 companies in the table on the right.

This group of companies, which is referred to as “the peer group”, was selected by identifying the biggest 50 companies that fit the following criteria:

- 1) Must be a purely upstream company
- 2) All production must be located within North America
- 3) The company must be part of the TSX or TSX-V.

All companies fitting this criteria that produced over 10,000 boe/d in Q3 2014 were included - 38 companies - and the remaining 12 are the companies with the next biggest market capitalization values as of Q3 2014.

Throughout the study, those companies in the group that produce more oil than gas (over 50% of total boe) are referred to as the “oil producers” and the remainder are the “gas producers”.

Peer Group Statistics Q3 2014:

Category	Total
Combined Daily Oil Production (bbl/d)	~1.1 million
Combined Daily Gas Production (mmcf/d)	~6,600
Combined Daily Oil & Gas Production (boe/d)	~2.2 million
Combined Market Cap. (Period End - Cdn\$)	~151 billion

Name	Ticker	Q3 boe/d production
Advantage Oil & Gas Ltd.	TSX:AAV	22,087
ARC Resources Ltd.	TSX:ARX	115,530
Athabasca Oil Corp.	TSX:ATH	6,381
Baytex Energy Corp.	TSX:BTE	94,093
Bellatrix Exploration Ltd.	TSX:BXE	37,838
Birchcliff Energy Ltd.	TSX:BIR	34,235
BlackPearl Resources Inc.	TSX:PXX	9,248
Bonavista Energy Corp.	TSX:BNP	74,720
Bonterra Energy Corp.	TSX:BNE	13,355
Canadian Oil Sands Ltd.	TSX:COS	87,787
Cardinal Energy Ltd.	TSX:CJ	7,587
Cequence Energy Ltd.	TSX:CQE	9,694
Chinook Energy Inc.	TSX:CKE	7,339
Connacher Oil and Gas Ltd.	TSX:CLL	14,163
Crescent Point Energy Corp.	TSX:CPG	141,183
Crew Energy Inc.	TSX:CR	20,846
DeeThree Exploration Ltd.	TSX:DTX	12,294
Delphi Energy Corp.	TSX:DEE	9,461
Encana Corp.	TSX:ECA	470,500
Enerplus Corp.	TSX:ERF	104,035
Freehold Royalties Ltd.	TSX:FRU	9,430
Gear Energy Ltd.	TSX:GXE	6,712
Journey Energy Inc.	TSX:JOY	11,002
Kelt Exploration Ltd.	TSX:KEL	13,872
Legacy Oil + Gas Inc.	TSX:LEG	25,004
Leucrotta Exploration Inc.	TSX-V:LXE	2,416
Lightstream Resources Ltd.	TSX:LTS	38,837
Long Run Exploration Ltd.	TSX:LRE	34,795
MEG Energy Corp.	TSX:MEG	76,471
Northern Blizzard Resources Inc.	TSX:NBZ	20,279
NuVista Energy Ltd.	TSX:NVA	18,030
Painted Pony Petroleum Ltd.	TSX:PPY	14,283
Paramount Resources Ltd.	TSX:POU	21,936
Pengrowth Energy Corp.	TSX:PGF	72,472
Penn West Petroleum Ltd.	TSX:PWT	100,839
Perpetual Energy Inc.	TSX:PMT	19,640
Peyto Expl. & Dev. Corp.	TSX:PEY	77,592
Pine Cliff Energy Ltd.	TSX-V:PNE	6,810
PrairieSky Royalty Ltd.	TSX:PSK	15,448
Raging River Exploration Inc.	TSX:RRX	10,679
RMP Energy Inc.	TSX:RMP	13,074
Spartan Energy Corp.	TSX:SPE	7,399
Spyglass Resources Corp.	TSX:SGL	13,518
Surge Energy Inc.	TSX:SGY	20,327
Tamarack Valley Energy Ltd.	TSX-V:TVE	5,765
TORC Oil & Gas Ltd.	TSX:TOG	11,436
Tourmaline Oil Corp.	TSX:TOU	107,997
Trilogy Energy Corp.	TSX:TET	35,125
Twin Butte Energy Ltd.	TSX:TBE	20,981
Whitecap Resources Inc.	TSX:WCP	34,940

Methodology:

Determining Sustainability of Production

To determine the overall capability of this peer group of Canadian oil and gas producers to deal with a falling oil price – i.e. how sustainable the peer group's current production is – this study compared notional revenues at three different, notional WTI prices with average costs over the past 2 years (Q1 2013-Q3 2014). The definitions of each metric used is described below.

Revenue per Barrel of Oil Equivalent (boe)

To measure sustainability, a company's notional revenue per boe in any given pricing climate must be considered at all times. To calculate this for the peer group of 50 companies, the first step was to identify the average relationship (+/- %) between each company's realized oil and gas prices and the benchmark WTI oil and AECO gas prices in the period Q1 2013 – Q3 2014. Then, a notional WTI and AECO value was used to calculate notional revenue per boe estimates for each company using their respective oil and gas production levels in Q3 2014.

In this study, three notional WTI prices were taken into account: **US\$90, US\$60 and US\$50.**

Once this notional revenue per boe had been estimated, the next step was to identify some costs to compare it to.

Definitions of Break Even Costs

1) Cash Costs: The cash cost is the most basic of the break even measures used in this report. It simply combines production costs per boe (including production taxes) with transportation costs per boe and selling, general & administration (SG&A) costs per boe. If an oil and gas company can cover this cost with their revenue per boe, then the company can continue to produce oil and gas at the same rate in the short term. Just covering this cost is not

sustainable long term however, as no allowance is made for replacement costs or return on capital.

2) Accounting Costs: This is similar to the cash cost measure but depletion, depreciation and amortization (DD&A) and exploration costs are also taken into account. Covering this cost with revenue per boe will result in a positive earnings per share (EPS) figure from E&P operations, which may keep shareholders relatively happy in the short term.

3) Full Cycle Costs: The next and final level includes costs that account for the cost of capital and reserve replacement. DD&A and exploration costs from the accounting cost definition are replaced by a finding & development (F&D) cost per boe and the cost of capital is estimated using interest expense and dividend payments, both on a per boe basis. The F&D cost used in the study was a 3 year average as reported by each company in 2013 annual reports. If the revenue per boe persists above this full cycle cost, then the company has the incentive to continue investment and activity.

If the revenues fall below this cost for a prolonged period however, the operations of the company should be considered unsustainable, meaning that capital spending, production and efforts to replace reserves will begin to gradually fall off as a result.

How to Calculate the Break Even Cost of Oil & Gas Production

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Methodology:

Determining Sustainability of Production

The break even costs that were used in this study are summarized in the table below.

Cost Type	Formula (all per boe)	If a Company Can Cover it with its Revenue per boe...	Note
Cash Cost	Prod Costs (inc. tax) + Transportation + SG&A	It can continue producing in the short term at the same rate	n/a
Accounting Cost	Prod Costs (inc. tax) + Transportation + SG&A + DD&A + Exploration Expense	E&P EPS will be positive	If a company can cover the Cash Cost, but not this Accounting Cost, it will be able to continue producing, but E&P EPS will be negative.
Full Cycle Cost	Prod Costs (inc. tax) + Transportation + SG&A + F&D + Interest Expense + Dividend Payable	The company's operations can be considered to be sustainable in the long-term	If a company can cover the first two costs, but not this one, it will be able to continue producing, EPS will be positive, but it cannot sustain operations long-term and will still run into trouble eventually.

Throughout the study, the average break even costs for the companies in the periods between Q1 2013 and Q3 2014 remained constant.

The only variable that changed was the WTI benchmark. Please refer to page 15 for all assumptions used in this study.

Once the companies in the peer group had been assessed at different WTI prices for their break even costs, other aspects of a company's make up were also taken into account to determine who is likely to be further squeezed by plunging oil prices. In this study, two further aspects were considered:

1) Debt Position

Obviously, if a company has high levels of debt and enters a period of lower oil prices and greater uncertainty, the company's ability to manoeuvre out

of difficulty is limited. This study considered current (Q3) debt-to-equity and debt-to-capital ratios for each company in the peer group, to give a feel for which companies are constrained by debt to the greatest extent.

2) Hedging Contracts in Place

If a company has a large portion of their oil production secured for the next quarter (Q4) under various hedging contracts, then the effect of the falling oil price will be much more gradual. A high level of coverage will enable greater income for a longer time, meaning less immediate requirement to cut back on costs. Of course, this is only a factor due to how dramatic the fall in oil price has been; companies will have active contracts in place that mean they will be selling oil at old price levels. Over a sustained period of lower oil prices, hedging contracts will be much less significant.

Notes, Definitions and Assumptions

Main Assumptions

The WTI oil price is the only changing variable, therefore:

- a) The AECO gas price will remain constant at Cdn\$4.30 throughout as it is used to differentiate the effect of the changing oil price on heavily weighted oil producers vs. gas producers only. This is a study on the falling oil price only since the gas price has been relatively stable compared to oil in recent times.
- b) Any costs that would likely fall in a falling oil price climate have not been taken into account, costs remained constant at the average cost for each company from Q1 2013 to Q3 2014. Production taxes and raw material supply involved in E&P operations (both included in production costs) would be two such costs to E&P companies that may fall if the oil price falls. How much these costs may fall at various price levels has not been assumed for the peer group as a whole. This is not a definitive forecast, rather a study of which companies have various characteristics that make them strong or weak in a falling oil price climate.

Average cost levels between Q1 2013 and Q3 2014 have been used throughout. Consequently the impact of any dramatic changes in cost profiles in the 7 quarter period being looked at – a company selling off an entire loss making business segment in Q4 2013 for example – will be lessened. This avoids any stark anomalies in the data set, but equally means that costs that may no longer be relevant do have an impact on the data used in the study.

Some companies in the study do not measure their oil price or hedge their oil production against WTI, using different benchmark prices instead, such as Western Canadian Select or Edmonton Par. WTI was selected as the benchmark price for this study as the **majority** of companies in the peer group of 50 use this price to hedge their oil production against.

In the full cycle costs, not all companies in the group reported F&D costs. If this was the case, DD&A per boe was used in the full cycle formula instead. Most companies that did not report F&D costs were recent additions to the Canadian Oil & Gas industry, so the difference between F&D and DD&A per boe can be considered far more negligible than normal, as the assets in question were, in most cases, new.

The cost of capital (used in full cycle costs) is usually calculated by using WACC instead of using interest costs and dividend payments. These items have been used as an alternative to WACC so that the report is created entirely from data available in the CanOils database.

US\$ WTI amounts were converted to Cdn\$ throughout the study at the rate of 1:1.15758 to calculate notional revenue per barrel metrics

The “**oil producers**” of the peer group refers to those companies whose production portfolio consists of greater than 50% oil. The “**gas producers**” are those with less than 50% oil. Gas is reported in CanOils in cubic feet and is converted to barrels of oil equivalent at the ratio of 6,000 cubic feet of gas being equal to 1 barrel of oil.

Debt Metrics

1) Debt-to-Equity

Total Debt / Total Shareholders' Equity inc. Non-Controlling Interests

2) Debt-to-Capital

Total Debt / (Total Debt + Shareholders' Equity inc. Non-Controlling Interests)

Both are measures of a company's financial leverage, showing the proportion of **equity** and **debt** that the company is using to finance its assets. Evaluate Energy and CanOils generally treat ratios of around 30%-35% as “healthy”.

How Can We Help You?

This report was created using the CanOils Database.

The CanOils Database provides actionable insight into Canadian Oil and Gas with complete coverage of TSX & TSX-V listed players.

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