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Analysis: Cash flow in U.S. Oil & Gas

Assessing the impacts of cuts in capital expenditure, cash from operating activities and financing gaps

- Larger vs. smaller producers
- Oil vs. gas producers
- Bakken vs. Marcellus vs. Permian Basin companies

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October 2016

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Analysis: Cash flow in U.S. oil & gas

The relationship between operating cash flow and capital expenditure – and why it's crucial to U.S. energy companies

Ongoing oil price fragility, coupled with shifts in global energy demand, have prompted dramatic changes in the way U.S. companies review operating cash flow, capital expenditure and market risk. It's no surprise that in a sustained low-price market operators have cut down on the volume of cash being invested in development. What is interesting is how the gap between operating cash flow and cap-ex varies significantly, depending on the size of company and the location of its production. This internal financing gap determines:

- How far each company is able to fund cap-ex through its after-tax profits and how reliant each company's plans are on cash sourced externally
- How much confidence surrounds each individual company or peer group
- How far benchmark prices would need to rise to ensure a company would be able to entirely fund current cap-ex using only its operating cash flow.

Our analysis of 68 representative U.S. oil and gas companies from our complete coverage of all U.S. stock exchange-listed operators explores this internal financing gap between operating cash flow and cap-ex.

Among our key findings:

- **Funding with cash:** U.S. oil and gas companies are moving closer to being able to fund cap-ex plans with only operating cash flow than at any point during the past three years.
- **Pricing:** Companies more focused on oil production over gas production have larger financing gaps, and, on average, would have been able to completely fund Q2 2016 cap-ex with operating cash flow at a WTI price of $58, with all other factors remaining equal.
- **Size and scale:** Relatively smaller producers have a greater reliance on externally sourced cash with larger financing gaps than their larger producing counterparts.
- **Regions vary:** An almost complete cut-off in development plans in the Bakken has caused financing gaps to fall remarkably but also production to drop. Confidence in the Permian basin is much higher.

We hope you enjoy the full study.

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To learn more about this study, discuss any analysis provided or to simply find out more about Evaluate Energy and our products, get in touch!

Calgary: +1 (403) 269 6003 London: +44 (0) 207 247 6120
Email: energyinfo@evaluateenergy.com

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Operating cash flow vs. cap-ex gap tightens

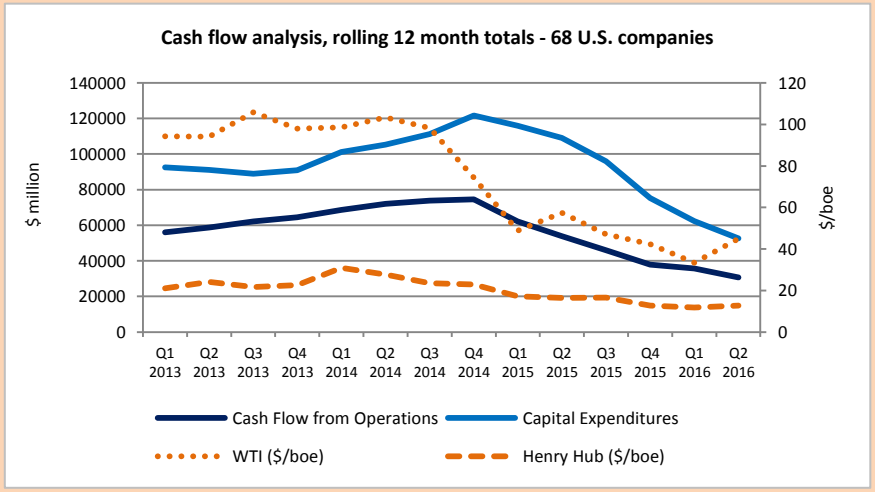
U.S. oil and gas companies are seeing cash flow from operations cover an ever-increasing portion of capital expenditure (cap-ex) since they began adjusting to the harsh reality of a lower-for-longer oil price in mid-2015.

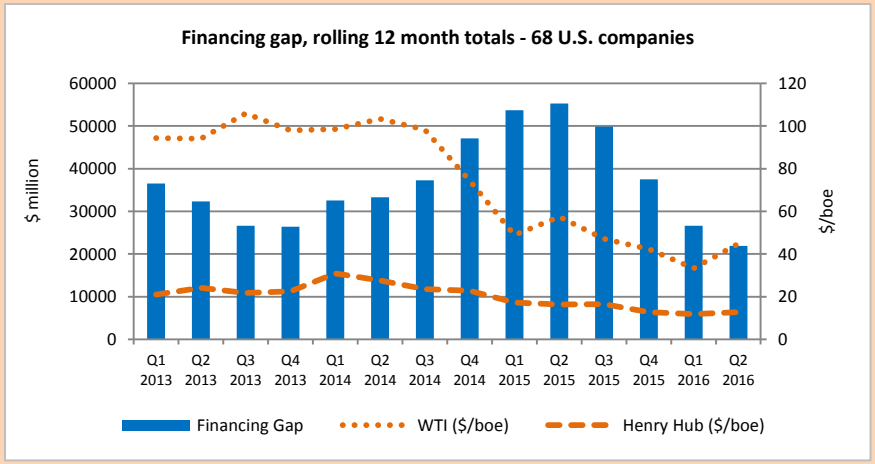
In fact, in Q2 2016, the difference between operating cash flow and cap-ex, which we refer to as the "financing gap" or "internal financing gap," fell to $22 billion, on a rolling 12 month basis. That is its lowest level since the beginning of 2013, according to our analysis of 68 U.S. oil and gas companies of varying production sizes. *For more information on company selection: pp. 11-13.*

Given that just over 12 months ago the equivalent, annualized financing gap was $55 billion, this marks an enormous drop – and it all revolves around the oil price downturn. The main drivers of today's low financing gap are:

- **Dramatic cuts in capital expenditure.** Q2 2016 saw the 68 companies spend 57% less on cap-ex on a rolling 12 month basis than Q4 2014, which was just after oil prices began to drop. The sharpest quarter to quarter drop took place between Q3 2015 and Q4 2015, when annualized cap-ex fell by 21% ($21 billion).
- **A slight rise in oil prices.** Early 2016 witnessed a deceleration in the fall in cash flow from operations. Cash generated from operations was lower in Q2 2016 than the two prior quarters, on a rolling 12 month basis, but cap-ex was falling at a much faster rate, which saw the financing gap close somewhat.
- A handful of the 68 companies, despite not being involved in bankruptcy proceedings at the end of Q2 2016, **would have struggled to find cash from external sources** to fund cap-ex plans that would far outstretch cash generated internally.
- **Delaying development work** while awaiting a commodity price rebound in the near future.

In this study, "cash from external sources" includes cash generated from the issuance of new shares, taking on new debt or selling assets or business units.





Notes: 1) All data in the above charts is calculated using the Evaluate Energy database. 2) Each quarterly figure for Cash flow from operations, capital expenditures and financing gap is calculated as the combined total of the quarter in question and the three previous quarters. 3) WTI and Henry Hub per boe benchmark prices represent the average price for each quarter. 4) The "Financing Gap" is simply a subtraction of the 12 month rolling total cash flow from operations from the total capital expenditures over the same timeframe.

> ***"The financing gap was at its lowest at $22 billion in Q2 2016 on a rolling 12 month basis compared to any quarter since the beginning of 2013"***

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Stalling production growth

The sharp cut off in cap-ex over the past two years is finally starting to have an impact on production. Cap-ex has been cut across the board since the end of 2014, and while production trended upward from 2013 for a few quarters into 2015, we are now starting to see the rate of growth decline. While Q2 2016 production is around 40% higher than Q1 2013, it is similar to Q1 2016.

This production plateau does not bode well for near-term cash flow growth, assuming there is no sudden and significant recovery in commodity prices. Cash from operations will fall if production begins to drop, and this could lead to further cap-ex cuts.

A fall in production has already been recorded on the whole for the smaller of the companies we analyzed, namely those that produced under 30,000 boe/d in Q2 2016, and also for the six companies that make up the Bakken peer group. *More detail: pp.6-7.*

At present, as has been the case over the entire three-year period of this study, the group of 68 companies, and the majority of each peer group, have been able to cover cap-ex and other cash outgoings via cash from operations and external sources of cash, regardless of the varying internal financing gaps.

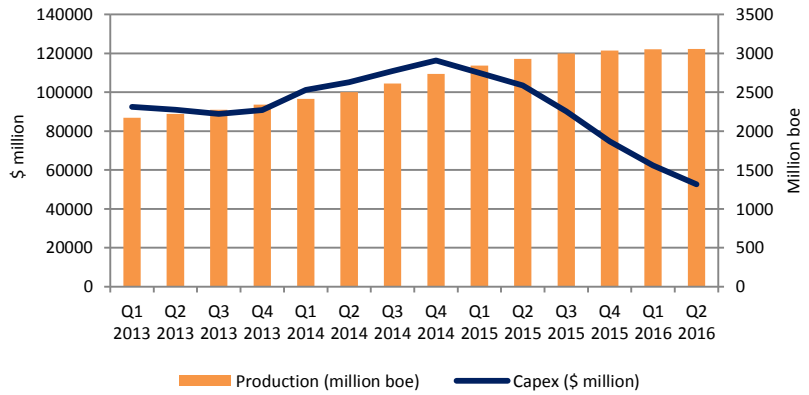
By looking at each peer group in turn throughout this study, you can see the types of company either more reliant on external sources of cash or with a greater ability to source external finance to close their internal financing gaps.

It is also important to note that for the 68 companies, there is never really a build up of cash reserves. Over the past three years, the overall uses or out-flows of cash (cap-ex, net debt repayment, dividend payment, net share repurchases and business acquisitions) have more-or-less tracked the sources or in-flows of cash (cash flow from operations, net increases in debt, net issuance of shares and asset/business unit sales).

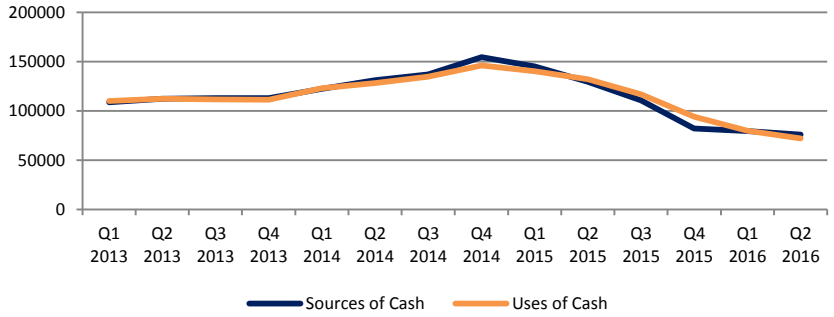
For the most part, it is encouraging that the 68 companies in Q2 2016 managed to begin to reverse the situation of late 2015 where cash out-flows significantly outweighed cash in-flows.

> *The sharp cut-off in cap-ex over the past two years is finally starting to have an impact on production.*

Production & cap-ex, rolling 12 month totals – 68 U.S. companies



Sources and uses of cash, rolling 12 month totals – 68 U.S. companies



Notes: 1) All data in the above charts is calculated using the Evaluate Energy database. 2) Each quarterly figure for capital expenditures, production volumes, sources and uses of cash is calculated as the combined total of the quarter in question and the three previous quarters. 3) Sources of cash refers to all cash inflow amounts, while uses of cash refers to all cash outflow amounts. Refer to the methodology page of this study (page 11) for further information on the constituent items in each total. 4) Production volumes are the total amount produced in each rolling 12 month period, rather than the daily average over those timeframes.

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Oil producers vs. Gas producers

For this section, we segregated the group of 68 companies into four peer groups based on their production mix, i.e. the percentage of each company's entire oil and gas production portfolio comprised of oil. *See charts on pp. 18-19.*

In Q2 2016 – and since Q2 2015 – companies with a more oil-focused portfolio generally had the largest financing gaps. Companies that produced over 75% oil had an average rolling 12-month financing gap of around $12/boe, while companies that produced under 25% oil had a gap of around $5/boe. This could be down to a number of factors:

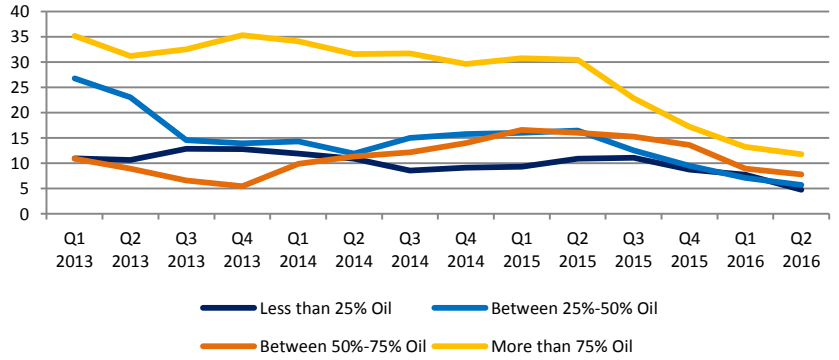
- Companies with relatively large gas production have been dealing with low prices for much longer than oil companies and may have leaner operations.
- A number of the producers in more oil-focused groups operate in regions where confidence is still quite high. External finance, aside from cash generated from operating activities, is still available to these companies. Larger, more extensive cap-ex plans are possible.
- A slight uptick in the WTI price in Q2 has had a definite impact on the data. The rolling 12-month cash from operations for the more oil-focused groups still dropped between Q1 and Q2 2016, but at a far slower rate than it did between Q4 2015 and Q1 2016. Meanwhile, cap-ex continued to drop.

Looking closer at the most oil-focused companies, those with over 75% oil production, we can see just how sharply cap-ex spending fell over the past year. On a rolling 12 month basis, in Q2 2016, cap-ex for these producers was less than half of the total from Q2 2015. Interestingly, the sharp drop is around an entire year after the WTI price began to fall.

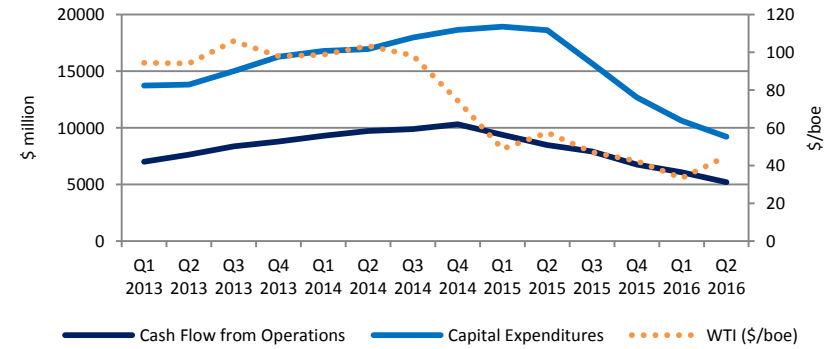
The rolling 12 month calculation itself had an impact on the data here, slightly lengthening the delay between cap-ex cuts and the price downturn. But there was still a delay, which could be down to a combination of companies being committed to long-term spending plans, or hedging contracts to generate higher revenues and enable greater short-term spending, plus a lingering belief in a price rebound. Since the cut in cap-ex, the annualized financing gap for the majority oil producers in Q2 2016 is only 40% of the financing gap in Q2 2015.

> ***"In Q2 2016 – and since Q2 2015 – it was the companies with a more oil-focused portfolio that generally had the largest financing gaps"***

Financing gap per boe of production (by company production mix) rolling 12 month totals ($/boe)



Cash flow analysis, rolling 12 month totals – companies that produce over 75% Oil



Notes: 1) All data in the above charts is calculated using the Evaluate Energy database. 2) Each quarterly figure for financing gap per boe has been calculated by dividing the peer group's rolling 12 month financing gap by the total oil and gas produced by the peer group over the 12 month period. 3) The "Financing Gap" is simply a subtraction of the 12 month rolling total cash flow from operations from the total capital expenditures over the same timeframe. 4) Production mix was calculated using Q2 2016 production only.

Larger producers vs. Smaller producers

For this section of the study, the 68 companies were segregated into three peer groups (*Refer to pp. 15-17 for all size-related charts)*:

1. "Large producers" produced over 150,000 boe/d in Q2 2016
2. "Medium producers" produced between 30,000-150,000 boe/d
3. "Small producers" less than 30,000 boe/d

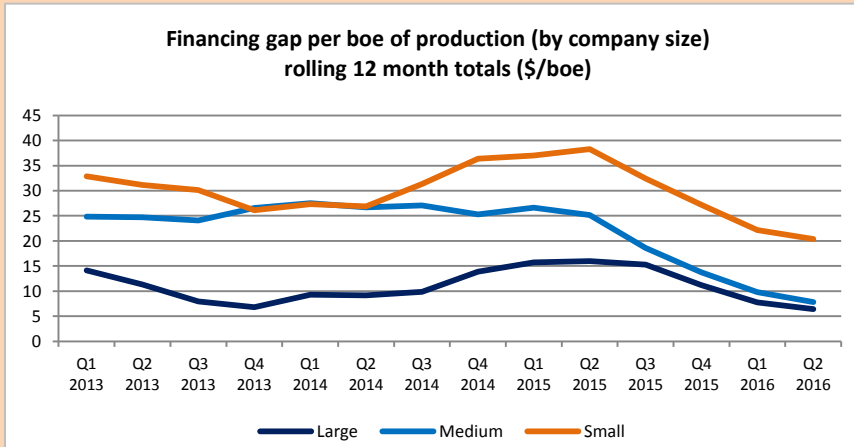
The small producers had larger financing gaps relative to their production in Q2 2016 ($20/boe) than the medium ($8/boe) or large ($6/boe) producers.

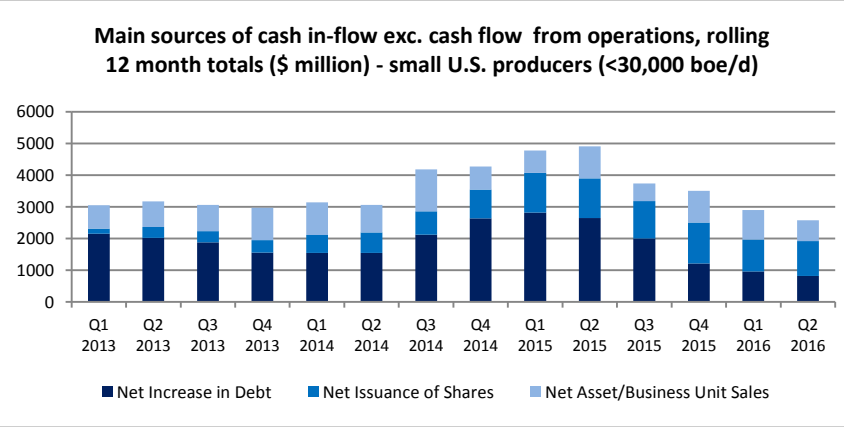
This could be for a number of reasons:

- Larger companies are more likely to have greater inventories of oil and gas leases that are "held-by-production" (HBP). If a lease is HBP, development work is not required to maintain ownership, i.e. a company with large HBP land holdings can cut cap-ex significantly with little consequence. Smaller companies are less likely to be in this position and will need to spend to fulfil work commitments in spite of the oil price.
- Over the past two years, smaller companies faced more financial issues. As this study does not include companies involved in bankruptcy proceedings, our peer group includes the "best" small companies. Confidence is likely higher overall, so cap-ex plans will be more bullish, creating a larger combined financing gap for the group as a whole.
- Many companies in the group of 68 are shale gas or liquids producers. Much drilling and development work is required to even *maintain* production levels for these companies. Smaller companies will be less able to weather lower production at low prices as each barrel lost represents a larger portion of revenue. This could lead to higher cap-ex spending for small companies.

Also of note is that, despite the larger financing gap, small producers have still been able to fill that internal gap with cash from other sources, for now. In fact, in 2016, small producers raised external funds at a similar level to 2013, when oil was around the $100 mark. The companies, however, have looked towards selling stock in 2016, rather than raising debt, perhaps aiming to benefit from bargain hunting investors wanting to enter the oil market at a low price.

> ***"The small producers had larger financing gaps relative to their production in Q2 2016 ($20/boe) than the medium ($8/boe) or large ($6/boe) producers."***





Notes: 1) All data in the above charts is calculated using the Evaluate Energy database. 2) Each quarterly figure for financing gap per boe has been calculated by dividing the peer group's rolling 12 month financing gap by the total oil and gas produced by the peer group over the 12 month period. 3) The "Financing Gap" is simply a subtraction of the 12 month rolling total cash flow from operations from the total capital expenditures over the same timeframe. 4) The 68 companies included in this study were separated into the following peer groups for this section: Large (all companies that produce over 150,000 boe/d), Small (all companies producing less than 30,000 boe/d) and Medium (all those in between). Please refer to the appendices for the full list of companies in each peer group. 6) Please refer to the methodology section of the study (page 11) for details on the sources of cash flow items included in the charts above.

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Bakken vs. Marcellus vs. Permian Basin

For this section, a selection of companies were taken from the whole group of 68 based on their main operating areas, to look at varying regional financing gaps. Three of the main producing areas of the United States – the Bakken and Marcellus shales and the Permian Basin – were well represented in the group of 68, with enough companies being purely located in them or carrying out the overwhelming majority of their operations in that one play to conduct comparative analysis between the regions. Six companies make up the "Bakken" group, six companies the "Marcellus" group and ten companies the "Permian Basin" group. *For more information on company selection: pp. 11-13.*

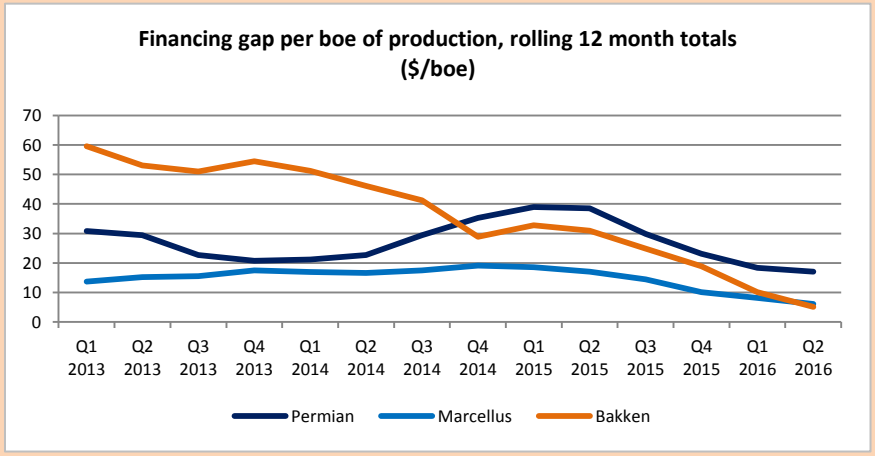
Relative to each group's respective production volumes, it is the Bakken play where the financing gap is currently the lowest at just over $5/boe, according to annualized Q2 2016 data. The Permian Basin has the highest financing gap per boe, at $17/boe, and the Marcellus is just over $6. Interestingly, looking at Q1 2013 data, the Bakken had the highest financing gap per boe by a very significant margin at $60/boe, indicating a huge change in circumstances between then and now.

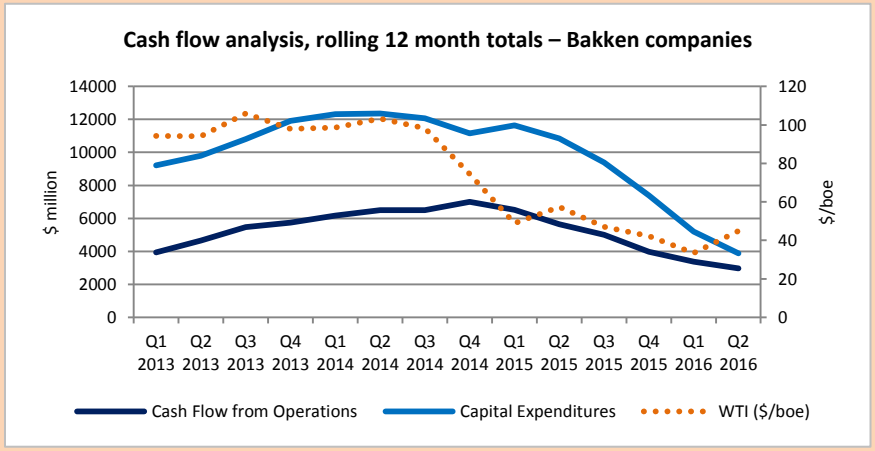
Bakken *(All charts on page 20)*

Bakken companies now cover 77% of their cap-ex spend on a rolling 12 month basis, with an annualized financing gap of just over $900 million in Q2 2016. This is in stark contrast to the prior $100 oil environment; between Q1 2013 and Q4 2014, the financing gap for Bakken companies never dropped below $5 billion. It is purely a drop in cap-ex that has driven the closing of the financing gap over the past year. Cash flow from operations is not dropping significantly faster in the Bakken than in any other region or any other peer group.

This suggests that the sudden drop in cap-ex is mainly down to either: an inability or unwillingness to source extra cash via the sale of newly issued shares or assets or the addition of new debt, or the postponement of development work by companies able to wait for a higher oil price environment. As noted earlier, however, the sharp cap-ex cut is beginning to impact production; the Bakken was one of the only subsets of the 68 companies to see a drop in annualized production between Q1 2016 and Q2 2016.

> ***"Bakken companies are now covering 77% of their cap-ex spending on a rolling 12 month basis, with a financing gap of just over $900 million in Q2 2016."***





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Bakken vs. Marcellus vs. Permian Basin

Marcellus *(All charts on page 21)*

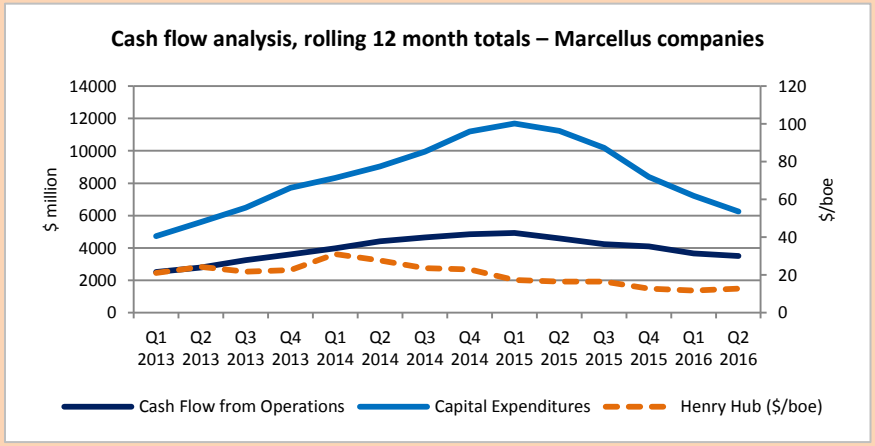
Everything about the data from the companies in the Marcellus looks far more gradual and less dramatic than any other peer group in this study, even though we see similar overall trends. This is due to a number of factors around the six companies we studied. The Marcellus group is comprised predominantly of larger producers. This means that factors impacting financing gaps for larger producers *(see page 6)* are at play here. Equally, the Marcellus is a gas-producing play, so it makes sense that Marcellus company data is similar to the gas-focused company data *(page 5)*.

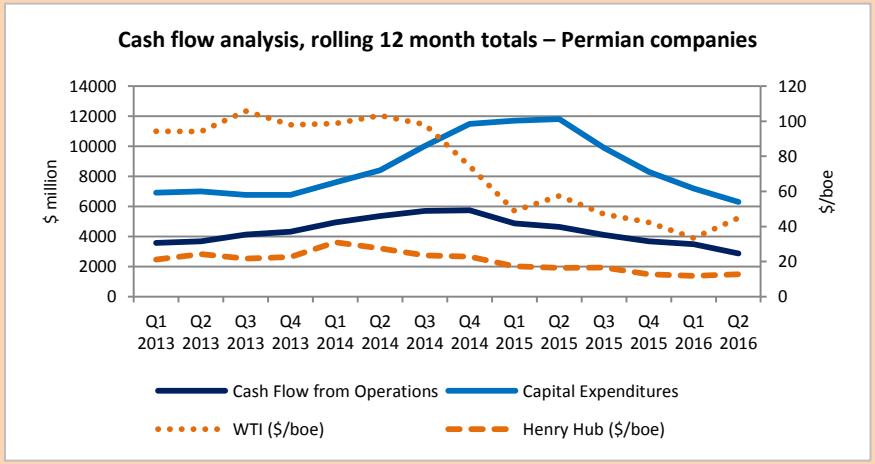
It is interesting to note in this peer group, however, that both cap-ex spends and cash from operations are not at their lowest on a rolling 12 month basis in Q2 2016. This could be down to the fact that the peer group is small and comprised of big, powerful producers, so a slight increase in spending for one company will have a large impact on the final figures. But it could also be indicative of large gas producers that have survived a long-term low price environment now being more agile with their lean operations.

Permian Basin *(All charts on page 22)*

Permian companies stand in stark contrast to Bakken companies. For while both are predominantly oil producers, Permian operators seem far more bullish. Of course, the trends in both spending and cash flow from operations are downwards like every other peer group in this study. However, Permian cap-ex is only 45% down in Q2 2016 compared to Q4 2014, the period where cap-ex for all 68 companies was at its peak. In the Bakken, the drop was 65%. The fall in rolling 12 month cash from operations is far less disparate over the same timeframe (Permian 50%, Bakken 57%). The differences here suggest that confidence in the Permian is much higher. The basin's relatively large average financing gap is very significant and suggests that producers in this lower cost environment are still willing and able to attract external finance. Companies in the Permian have seen success in raising cash through share issuances to fund their relatively large cap-ex plans and also to pay off significant amounts in debt.

> ***"Permian cap-ex is only 45% down in Q2 2016 compared with Q4 2014, the period where cap-ex for all 68 companies was at its peak. In the Bakken, the drop was 65%."***





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How high do prices need to rise?

Financing gaps can also be used to estimate how large an uplift in benchmark pricing is needed for a company to successfully fund their current strategy during the next quarter without the need for externally sourced cash.

This calculation assumes all cap-ex and production remains constant, and only allows for a change to be applied to either the WTI or Henry Hub price. This estimate is not a direct indication of break-even costs for each company, but rather another indication of the varying confidence levels being placed in the different peer groups and the regions they operate in. *Refer to the methodology section of the study (page 11) for a full description of the calculation used.*

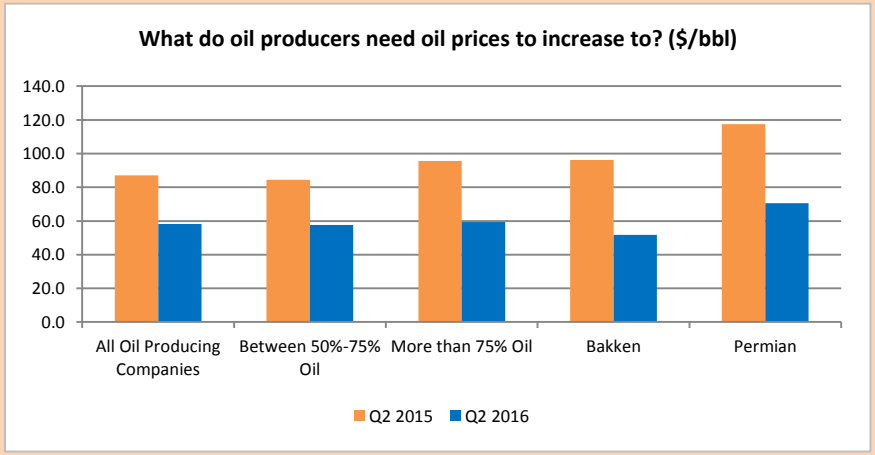
Looking at Q2 2016 and Q2 2015 data in parallel, it is clear that confidence across the industry is generally falling, with much higher prices required in periods following Q2 2015 to fund a company's strategy compared with the required prices for Q2 2016. But the differences between the various peer groups remains interesting.

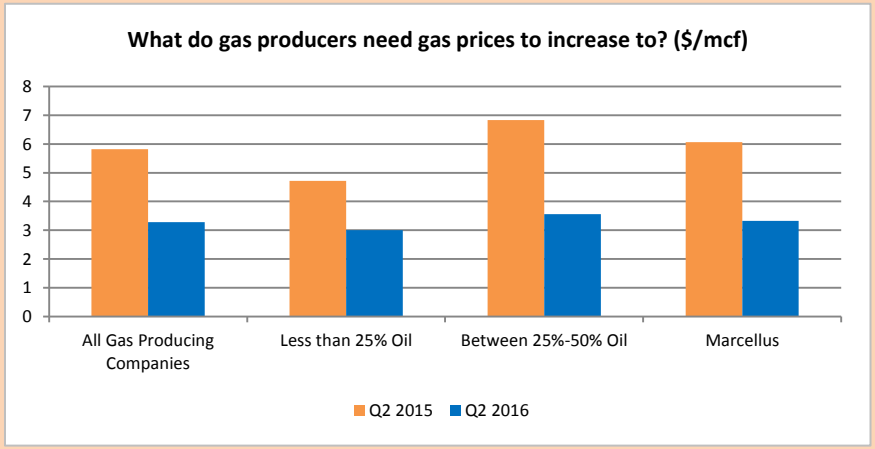
To successfully fund current strategy next quarter, the oil-focused companies would need benchmark, WTI oil prices to improve to around $58. This is without any externally sourced cash via share issuances, loans or asset sales and assumes cap-ex, production and benchmark gas prices remain constant.

The fact that Permian producers would need to see WTI prices increase to around $71 to fund current plans entirely through cash from operations is another clear indication of the confidence in this area now. The lack of confidence in the Bakken has seen development plans cut to the point where companies only need prices to improve to $52 to entirely fund current strategy.

In estimating the equivalent figure for gas-focused companies, using the Henry Hub benchmark price instead of WTI, we can see great similarity across the board, with an increase in Henry Hub gas prices to between $3-$3.60 per mcf required for each individual peer group. The companies with higher oil production in the gas-producing groups have a higher "desired gas price" due to their greater relative reliance on an increase in oil prices to bolster revenues generated from NGL/condensate sales.

> ***"To successfully fund current strategy next quarter, the oil-focused companies would need benchmark, WTI oil prices to improve to around $58."***





Notes: 1) All data in the above charts is calculated using the Evaluate Energy database. 2) Each quarterly figure for financing gap and production is calculated as the combined total of the quarter in question and the three previous quarters. 3) WTI per boe benchmark prices represent the average price for each quarter. 4) To calculate the required price increases, the rolling 12 month financing gaps for oil companies was divided by their respective levels of oil production, and the resultant $/bbl figure was added to the average quarterly WTI price in Q2 2015 and Q2 2016 respectively. For the gas companies, gas production was used instead of oil production to create a $/mcf figure, and this was combined with the quarterly average Henry Hub price instead of the WTI price.

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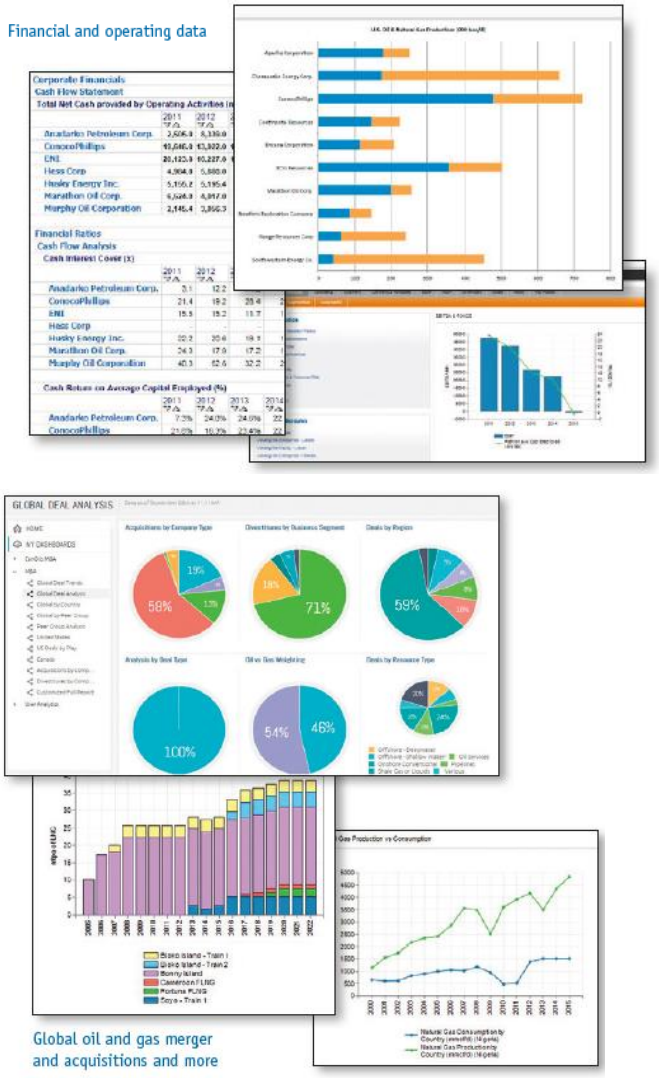

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Calgary: +1 (403) 269 6003 London: +44 (0) 207 247 6120
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Methodology

Selection of companies

- All 68 companies have over 65% of their Q2 2016 production within the United States and were not involved in bankruptcy proceedings before the end of June 2016.
- From there, the companies were split into various peer groups:

1) Firstly, **by size of production**: "Large" companies produced more than 150,000 boe/d in Q2 2016; "Small" companies produced less than 30,000 boe/d; "Medium" companies produced between these two values.
2) Secondly, the companies were split into groups according to whether or not the company was **a majority oil or gas producer**. There are four groups here: "Gas Producers" are made up of two groups where production was either under 25% oil or between 25%-50% oil, while "Oil Producers" are also two groups with production of either over 75% oil or between 50%-75% oil.
3) Finally, a handful of companies were then selected from the group to show regional differences. A comparison between the **Permian Basin**, the **Bakken** play and **Marcellus** play was conducted by taking data from a selection of companies that have the entirety or overwhelming majority of their operations in only one of the respective areas.

Data sources

- All data included in this study was either extracted directly from the **Evaluate Energy oil and gas financial and operating database**, or calculated using data that was originally extracted directly from Evaluate Energy.
- All cash-related data items used in this study have their basis in company quarterly cash flow statements:

1) **Capital expenditures** includes all cap-ex reported, and although this study focuses on majority-upstream focused companies, this figure may include some non-upstream related figures if a breakdown is not provided.
2) **Cash flow from operating activities** includes the non-cash effect of changes in working capital.
3) **Dividends paid** is a combination of dividends paid to common shareholders and minority interests.
4) **Net issuance/repurchase of shares** is a combination of share movement-related cash in-flows and out-flows.
5) **Net increase/repayment of debt** is a combination of all debt-related cash in-flows and out-flows.
6) **Net acquisitions/disposals of business units and assets** is a combination of all cash in-flows and out-flows related to acquisitions or disposals of assets or businesses.

- **The WTI and Henry Hub benchmark prices** are taken from the Evaluate Energy database but are calculated using pricing data from the U.S. Energy Information Administration (EIA).
- **Production** is sourced in 000 boe/d from the Evaluate Energy database and converted into 000 boe using the number of days in each quarterly period where necessary. Natural gas is converted from mcf to barrels of oil equivalent at the rate of 6:1.

Calculated Items

- **Financing gap** or **internal financing gap** is the calculated difference between capital expenditures and cash flow from operations, i.e. how far a company is away from entirely funding its spending plans with net cash generated by its own operations.
- **Sources of cash** are all items that, when fully calculated, produce a positive, cash-in-flow amount when studying the figures, while **Uses of cash** refers to a fully calculated negative, cash out-flow amount.
    - For "net" items, such as **net increase in debt** for example, the cash out-flows related to debt was subtracted from the cash in-flows related to debt in each period, and only the resultant positive net item was included as a cash in-flow. The individual in-flows and out-flows are not accounted for separately in the charts relating to uses and sources of cash; it is always a net figure.
- Every item is calculated on **a rolling 12 month, annualized basis**, to limit the ability of any anomalous quarterly amounts to skew the data. Each quarterly value was added to the values of the previous three quarters.
    - So, to calculate a capital expenditure value that appears in the Q2 2016 period in a chart, the Q2 2016, Q1 2016, Q4 2015 and Q3 2015 capital expenditure amounts would be combined.
- To calculate the required WTI or Henry Hub price increases on page 9 to entirely fund current strategy with cash flow from operations, the rolling 12 month financing gaps for oil companies were divided by their respective levels of oil production, and the resultant $/bbl figure was added to the average quarterly WTI price in Q2 2015 and Q2 2016 respectively. For the gas companies, gas production was used instead of oil production to create a $/mcf figure, and this was combined with the quarterly average Henry Hub price instead of the WTI price.
    - This calculation assumes that all cap-ex, production and the least relevant benchmark price remain constant (i.e. for oil producers, the Henry Hub is unchanged).

All $ amounts refer to United States Dollars throughout.

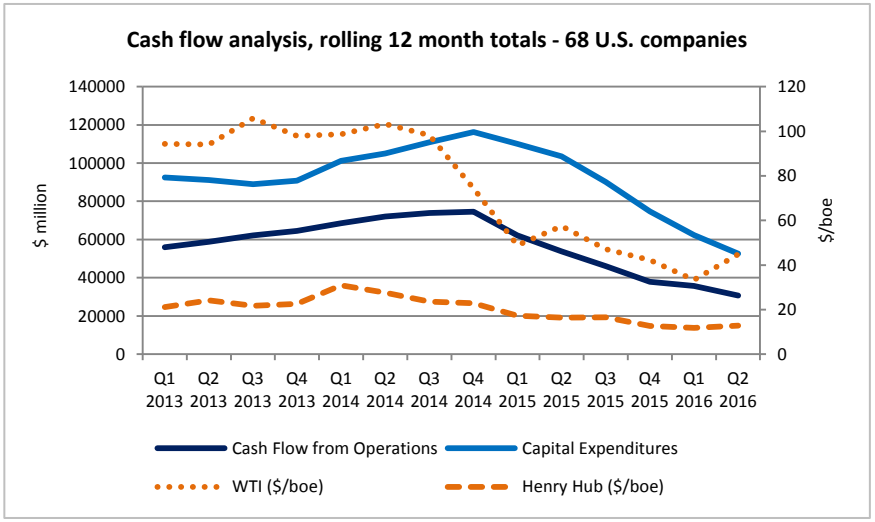
Appendix I - Companies

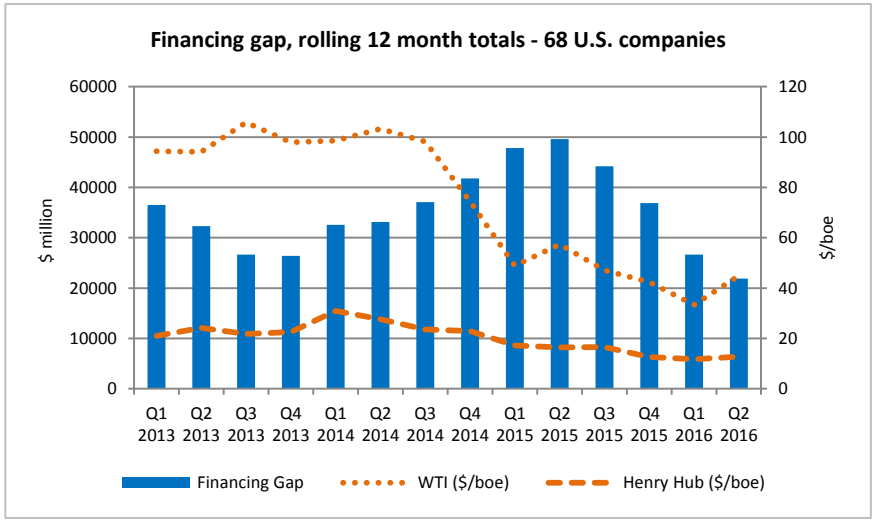
Company Name	Stock Exchange	Ticker	Q2 2016 Production (000 boe/d)	% Oil	Peer Group – Company Size	Peer Group - Play/Basin
Abraxas Petroleum Corp.	NASDAQ	AXAS	4.9	74%	Small	n/a
Anadarko Petroleum Corp.	NYSE	APC	791.7	54%	Large	n/a
Antero Resources Corp.	NYSE	AR	293.0	26%	Large	Marcellus
Approach Resources Inc.	NASDAQ	AREX	12.6	62%	Small	Permian
Atlas Resource Partners LP	OTC	ARPJQ	37.2	17%	Medium	n/a
Bill Barrett Corp.	NYSE	BBG	17.7	80%	Small	n/a
Bonanza Creek Energy Inc.	NYSE	BCEI	23.2	75%	Small	n/a
Cabot Oil & Gas Corp.	NYSE	COG	278.0	5%	Large	Marcellus
California Resources Corp.	NYSE	CRC	139.7	76%	Medium	n/a
Callon Petroleum Co.	NYSE	CPE	13.5	77%	Small	Permian
Carrizo Oil & Gas Inc.	NASDAQ	CRZO	41.5	70%	Medium	n/a
Chesapeake Energy Corp.	NYSE	CHK	657.1	25%	Large	n/a
Cimarex Energy Co.	NYSE	XEC	162.4	53%	Large	Permian
Clayton Williams Energy Inc.	NYSE	CWEI	13.6	84%	Small	n/a
Comstock Resources Inc.	NYSE	CRK	28.7	14%	Small	n/a
Concho Resources Inc.	NYSE	CXO	145.2	62%	Medium	Permian
CONSOL Energy Inc.	NYSE	CNX	181.9	11%	Large	n/a
Contango Oil and Gas Co.	NYSE MKT	MCF	12.4	31%	Small	n/a
Continental Resources Inc.	NYSE	CLR	219.3	61%	Large	Bakken
Denbury Resources Inc.	NYSE	DNR	64.5	96%	Medium	n/a
Devon Energy Corp.	NYSE	DVN	644.5	61%	Large	n/a
Diamondback Energy Inc.	NASDAQ	FANG	36.8	87%	Medium	Permian
Earthstone Energy Inc.	NYSE MKT	ESTE	3.8	73%	Small	n/a
Eclipse Resources Corp.	NYSE	ECR	39.3	29%	Medium	n/a
Energen Corp.	NYSE	EGN	64.2	79%	Medium	Permian
Enerplus Corp.	NYSE	ERF	93.7	47%	Medium	n/a
EOG Resources Inc.	NYSE	EOG	551.0	64%	Large	n/a
EP Energy Corp.	NYSE	EPE	84.5	70%	Medium	n/a
EQT Corp.	NYSE	EQT	338.0	9%	Large	Marcellus
EV Energy Partners LP	NASDAQ	EVEP	33.6	29%	Medium	n/a
EXCO Resources Inc.	NYSE	XCO	49.4	10%	Medium	n/a
Gulfport Energy Corp.	NASDAQ	GPOR	110.8	13%	Medium	n/a
Halcon Resources Corp.	NYSE	HK	35.9	88%	Medium	Bakken
Hess Corp.	NYSE	HES	312.8	71%	Large	n/a

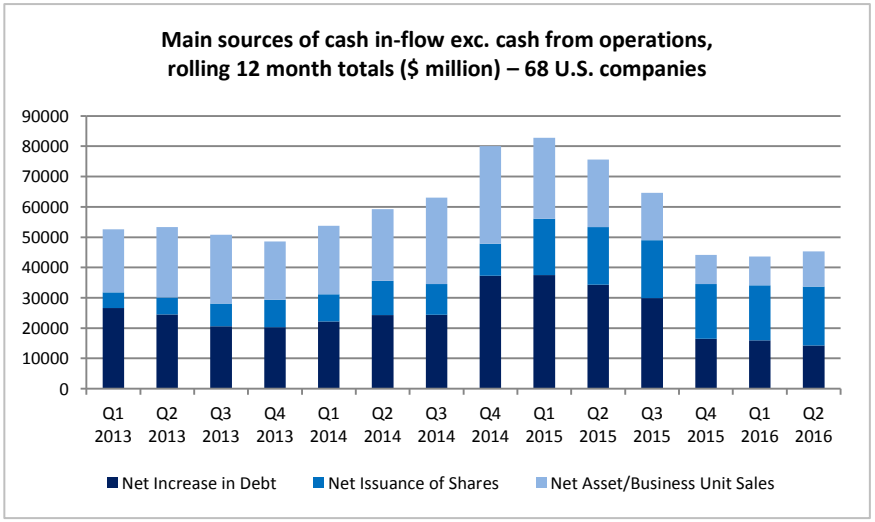
Appendix I - Companies

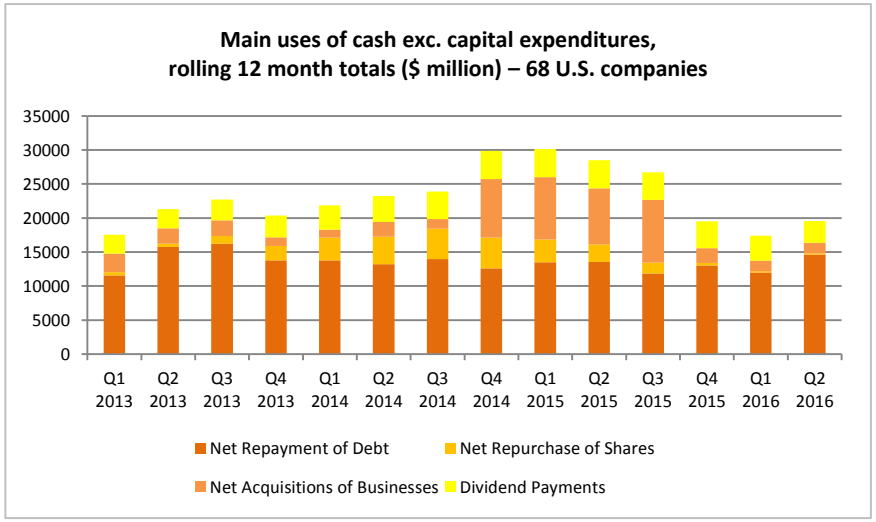
Company Name	Stock Exchange	Ticker	Q2 2016 Production (000 boe/d)	% Oil	Peer Group – Company Size	Peer Group - Play/Basin
Houston American Energy Corp.	NYSE MKT	HUSA	0.02	42%	Small	n/a
Isramco Inc.	NASDAQ	ISRL	1.5	55%	Small	n/a
Jones Energy Inc.	NYSE	JONE	18.6	55%	Small	Permian
Laredo Petroleum Inc.	NYSE	LPI	47.7	73%	Medium	Permian
Lilis Energy Inc.	OTC	LLEX	0.4	56%	Small	n/a
Matador Resources Co.	NYSE	MTDR	28.0	48%	Small	n/a
Mid-Con Energy Partners LP	NASDAQ	MCEP	4.1	94%	Small	n/a
Newfield Exploration Co.	NYSE	NFX	165.6	64%	Large	n/a
Noble Energy Inc.	NYSE	NBL	426.8	44%	Large	n/a
Northern Oil & Gas Inc.	NYSE MKT	NOG	13.9	86%	Small	Bakken
Oasis Petroleum Inc.	NYSE	OAS	49.5	83%	Medium	Bakken
Parsley Energy Inc.	NYSE	PE	35.7	84%	Medium	Permian
PDC Energy Inc.	NASDAQ	PDCE	57.1	59%	Medium	n/a
PEDEVCO Corp.	NYSE MKT	PED	0.4	75%	Small	n/a
PetroQuest Energy Inc.	NYSE	PQ	11.0	29%	Small	n/a
Pioneer Natural Resources Co.	NYSE	PXD	232.7	76%	Large	n/a
QEP Resources Inc.	NYSE	QEP	152.5	48%	Large	n/a
Range Resources Corp.	NYSE	RRC	236.8	36%	Large	Marcellus
Resolute Energy Corp.	NYSE	REN	11.9	86%	Small	n/a
Rex Energy Corp.	NASDAQ	REXX	33.2	37%	Medium	Marcellus
Rice Energy Inc.	NYSE	RICE	126.3	0%	Medium	Marcellus
Ring Energy Inc.	NYSE MKT	REI	2.1	83%	Small	n/a
RSP Permian Inc.	NYSE	RSPP	26.4	88%	Small	Permian
Sanchez Energy Corp.	NYSE	SN	55.9	62%	Medium	n/a
SM Energy Co.	NYSE	SM	157.3	55%	Large	n/a
Southwestern Energy Co.	NYSE	SWN	412.7	10%	Large	n/a
Stone Energy Corp.	NYSE	SGY	29.0	68%	Small	n/a
U.S. Energy Corp.	NASDAQ	USEG	0.8	61%	Small	Bakken
Unit Corp.	NYSE	UNT	47.9	45%	Medium	n/a
Vanguard Natural Resources LLC	NASDAQ	VNR	74.2	31%	Medium	n/a
W & T Offshore Inc.	NYSE	WTI	42.9	59%	Medium	n/a
Whiting Petroleum Corp.	NYSE	WLL	134.2	85%	Medium	Bakken
WPX Energy Inc.	NYSE	WPX	85.2	60%	Medium	n/a
Yuma Energy Inc.	NYSE MKT	YUMA	1.3	52%	Small	n/a

Appendix II – Charts, All Companies

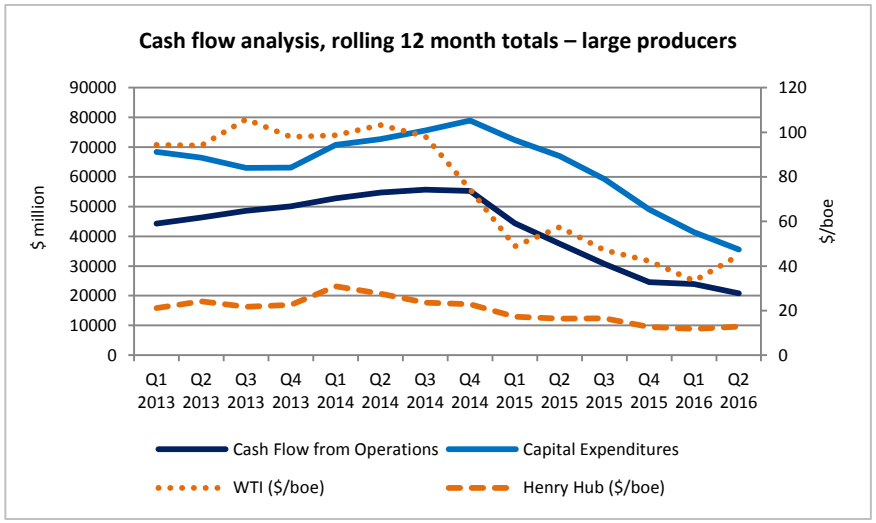


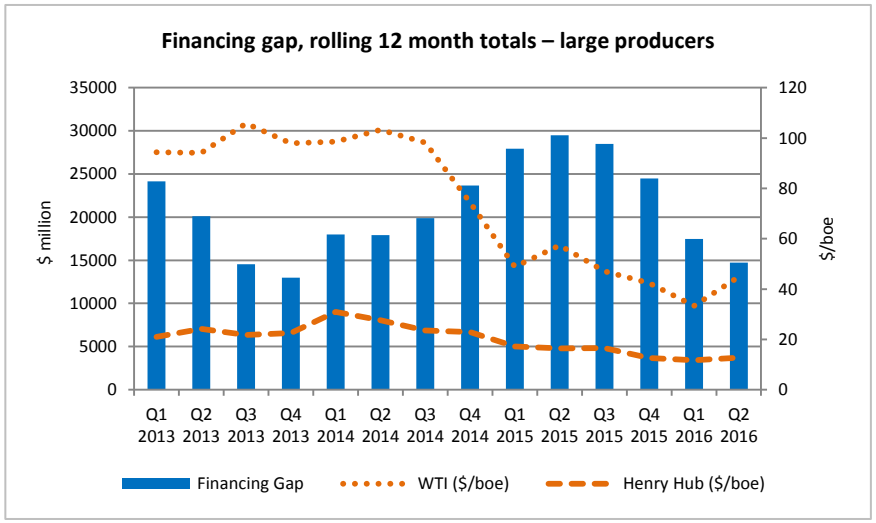


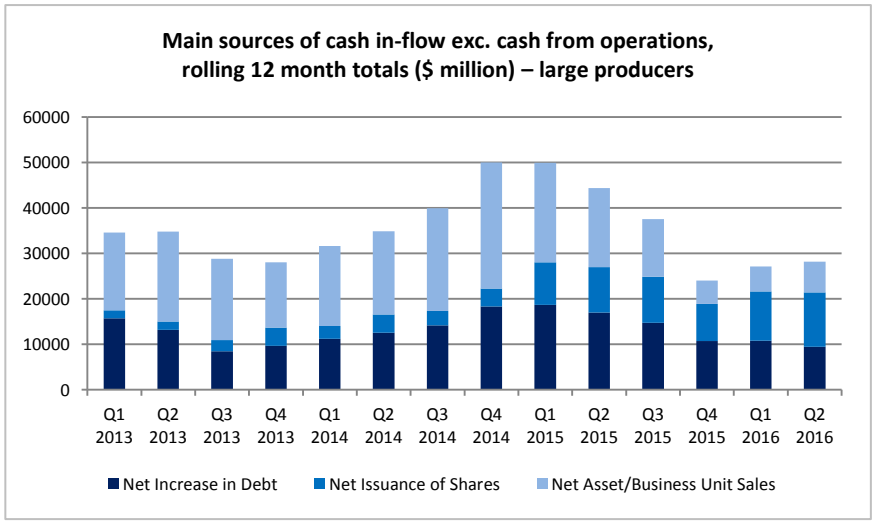


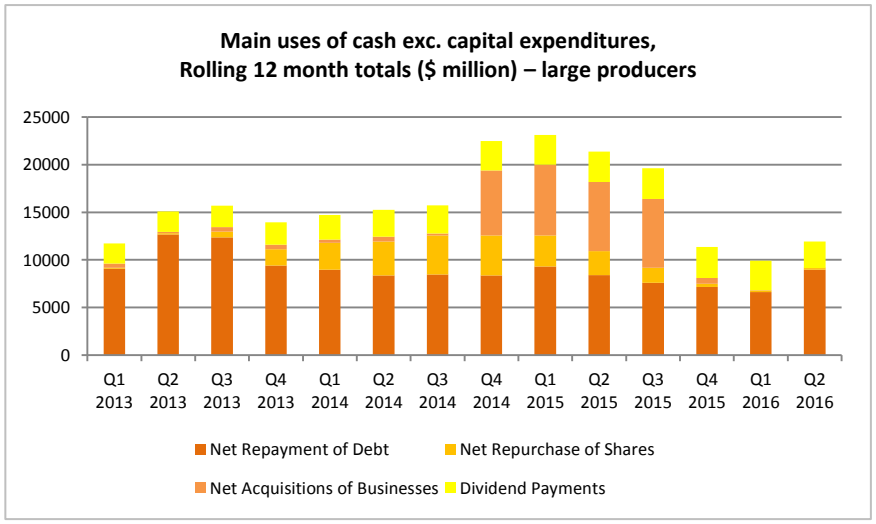


Appendix II – Charts, Large Producers

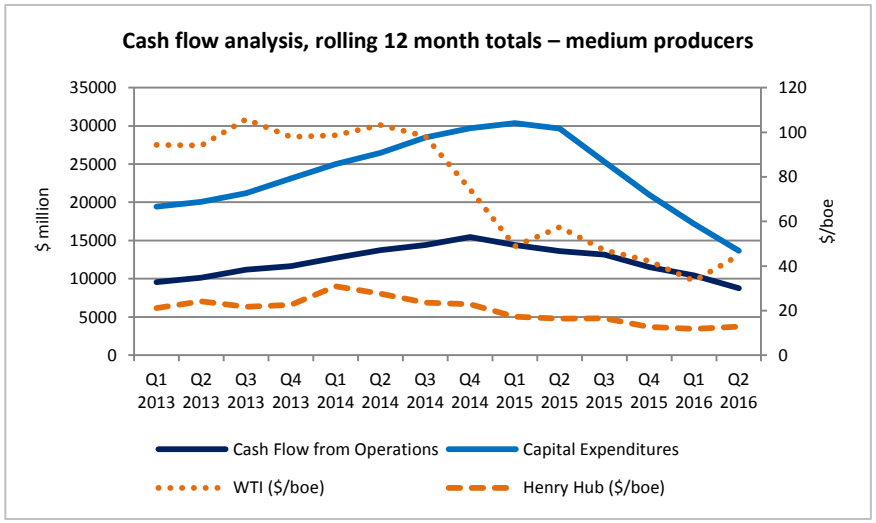


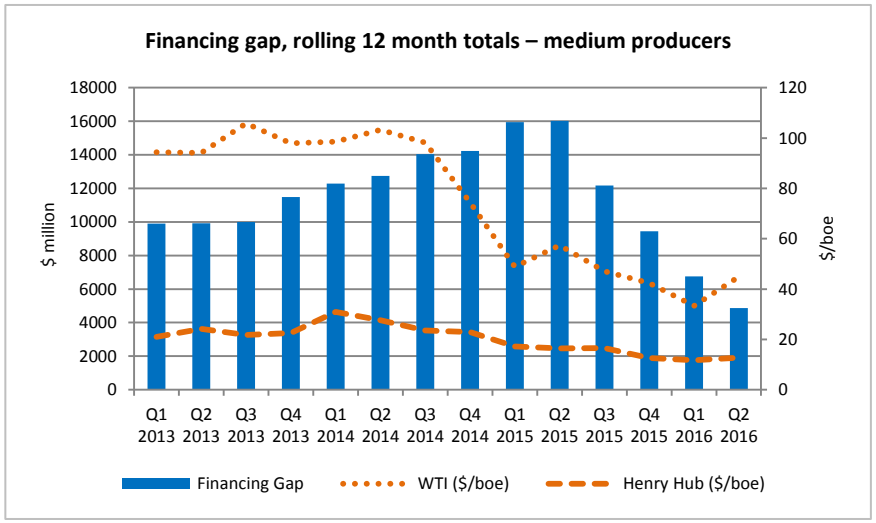


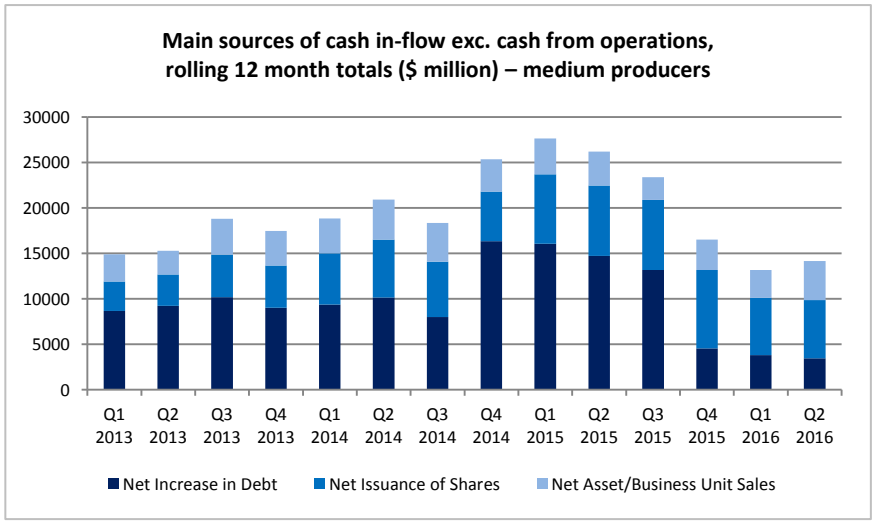


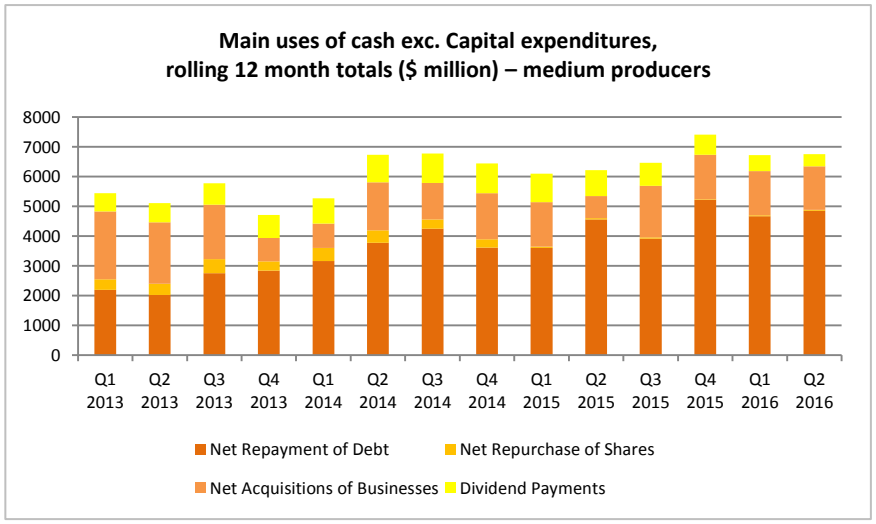


Appendix II – Charts, Medium Producers

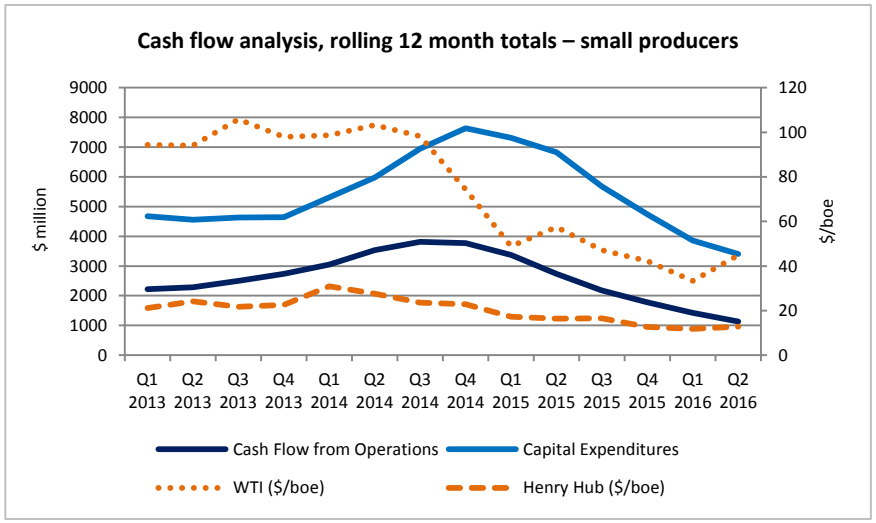


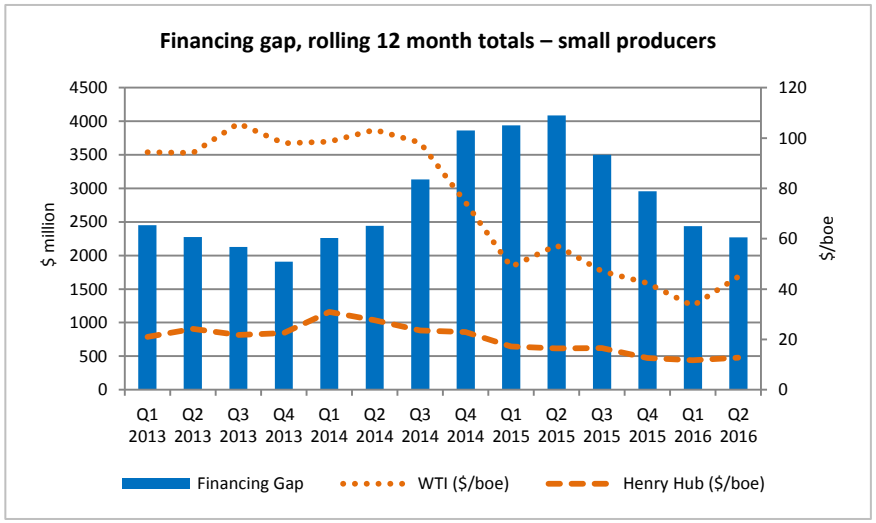


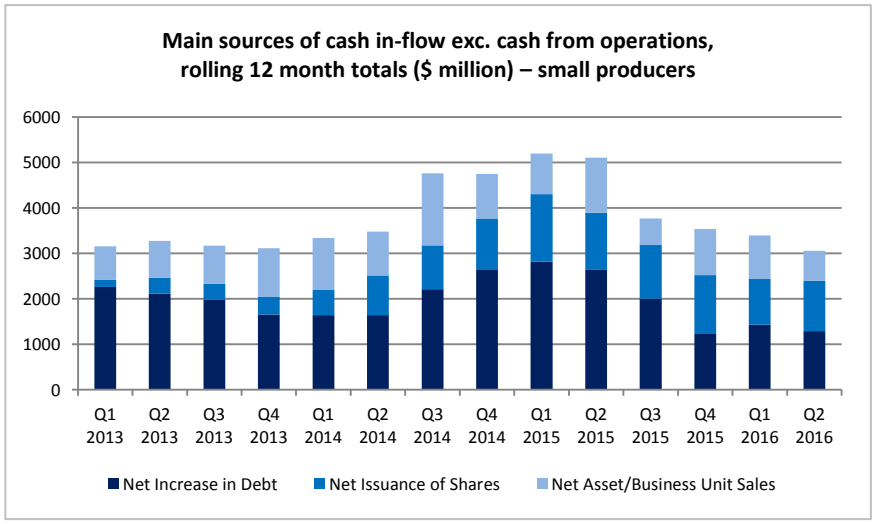


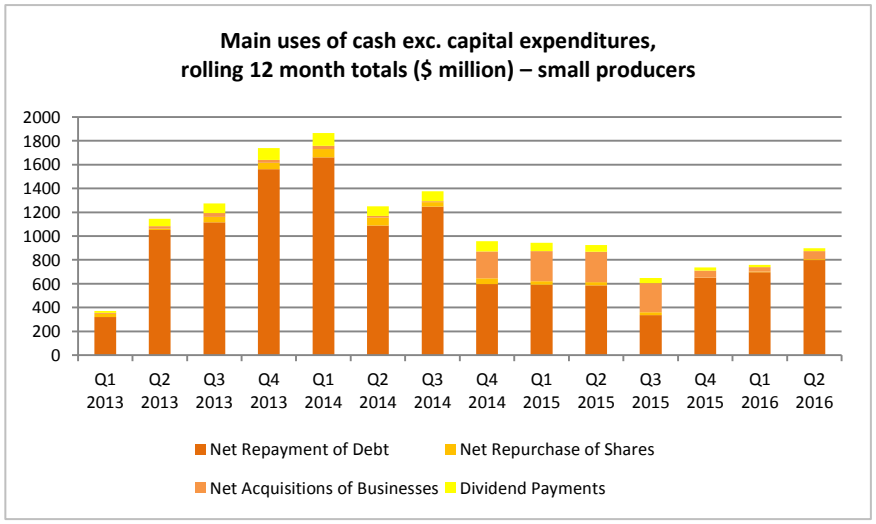


Appendix II – Charts, Small Producers



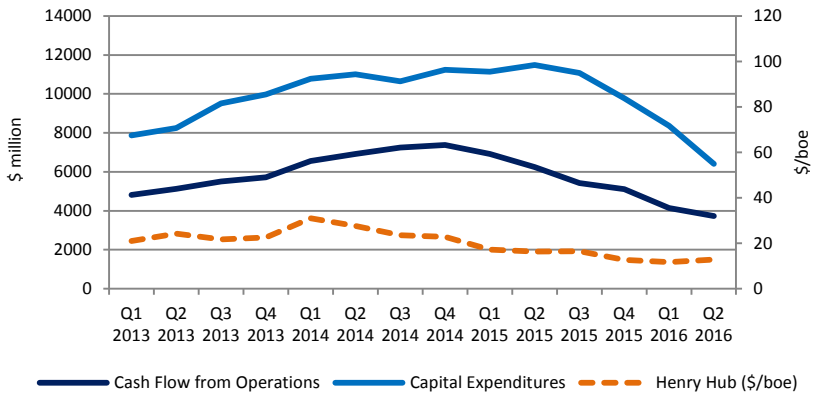




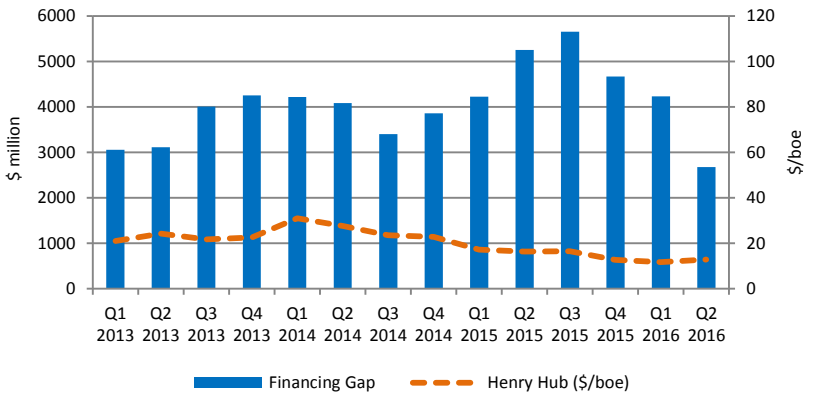


Appendix II – Charts, Oil vs. Gas (I)

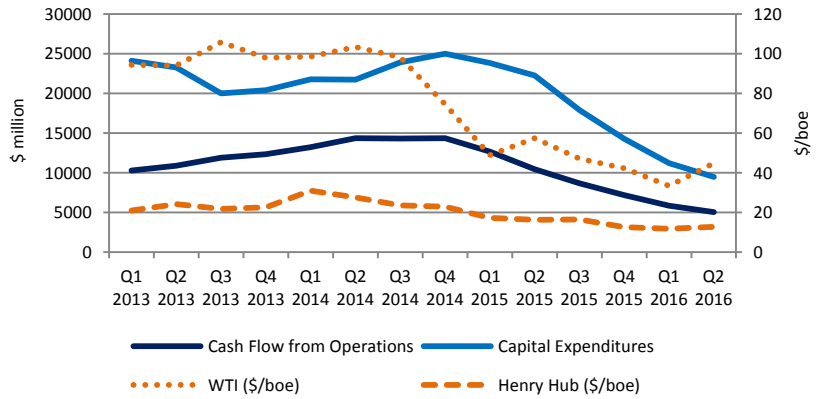
Cash flow analysis, rolling 12 month totals – companies that produce less than 25% oil



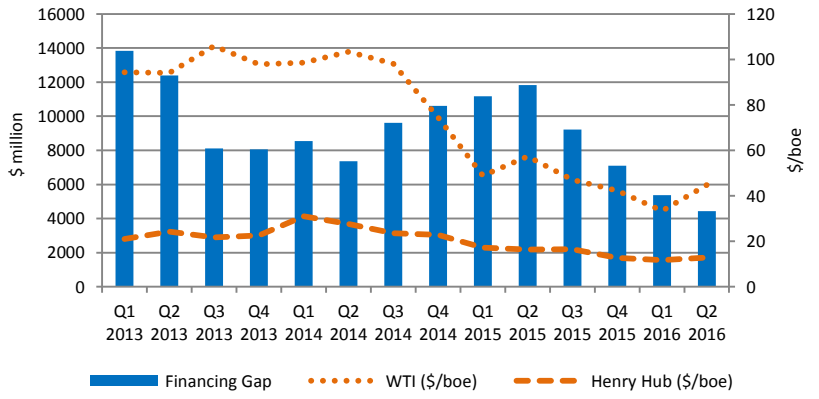
Financing gap, rolling 12 month totals – companies that produce less than 25% oil



Cash flow analysis, rolling 12 month totals – companies that produce between 25%-50% oil

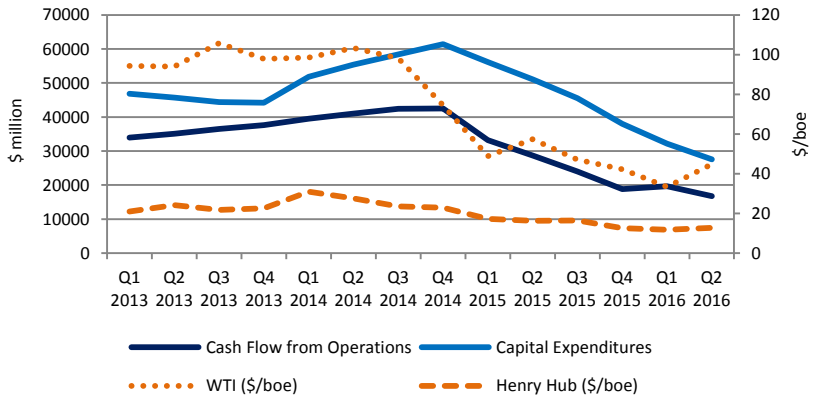


Financing gap, rolling 12 month totals – companies that produce between 25%-50% oil

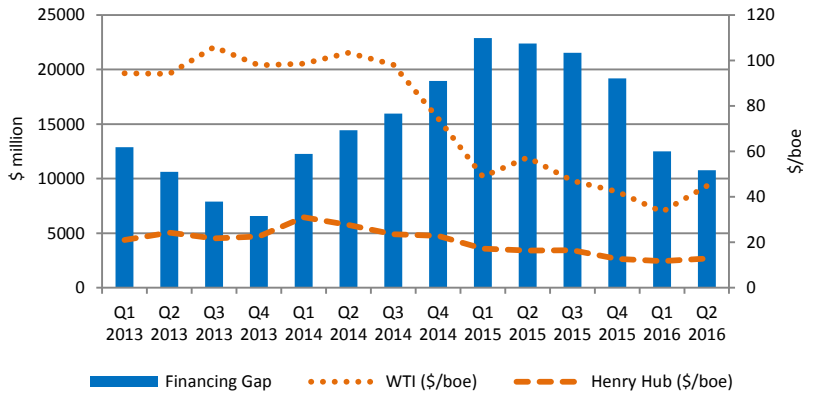


Appendix II – Charts, Oil vs. Gas (II)

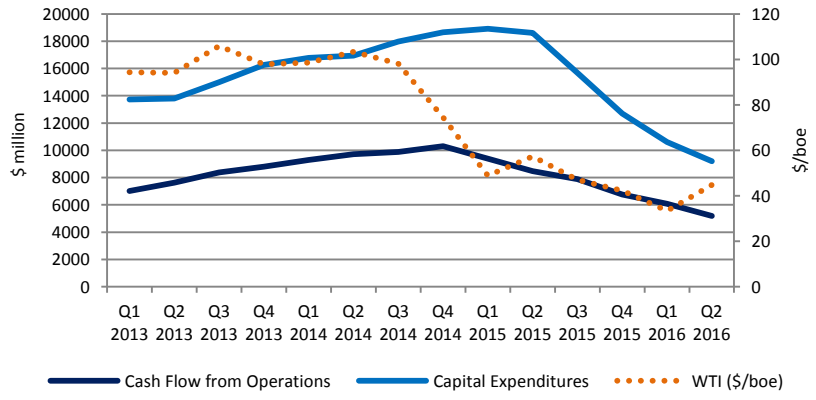
Cash flow analysis, rolling 12 month totals – companies that produce between 50%-75% oil



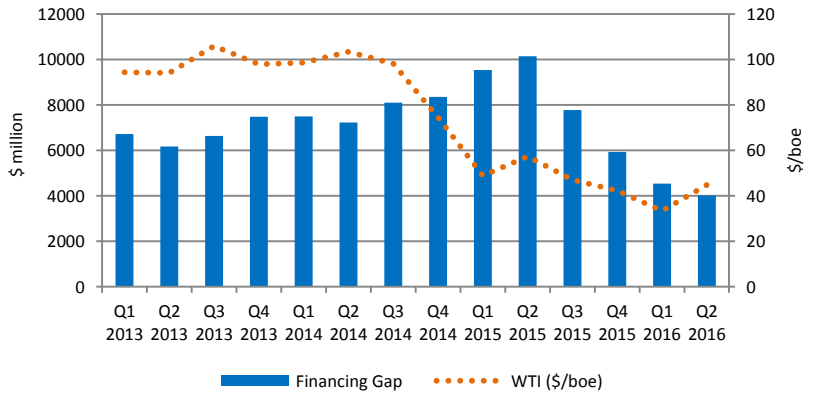
Financing gap, rolling 12 month totals – companies that produce between 50%-75% oil



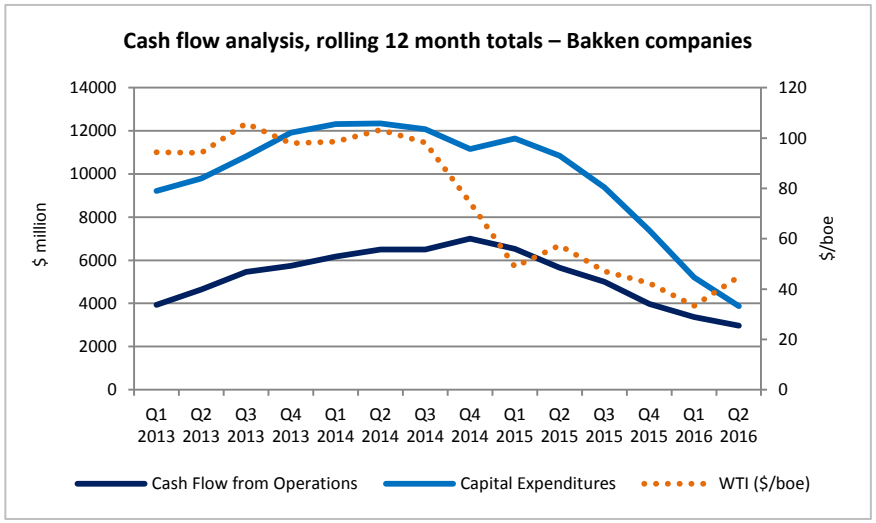
Cash flow analysis, rolling 12 month totals – companies that produce over 75% oil

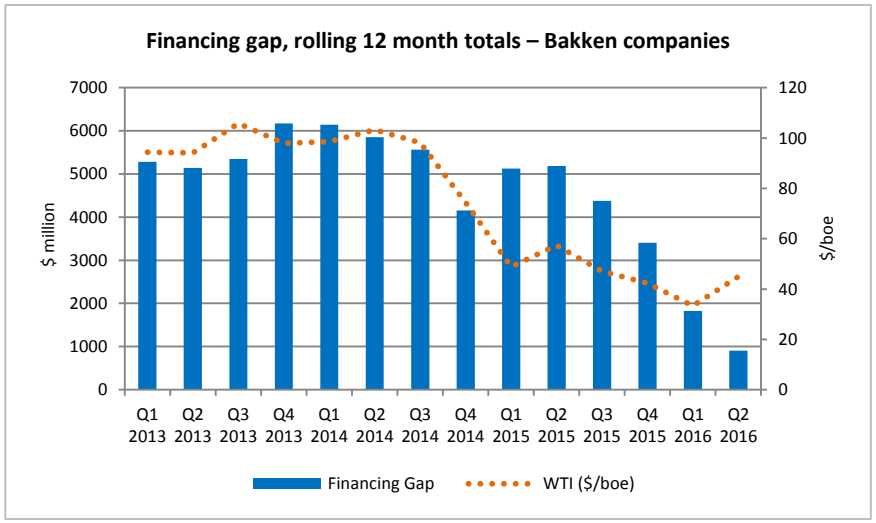


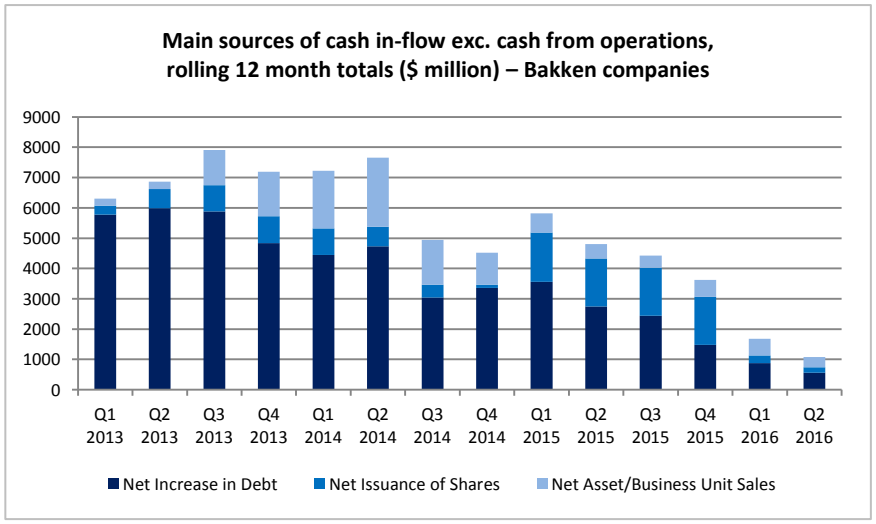
Financing gap, rolling 12 month totals – companies that produce over 75% oil

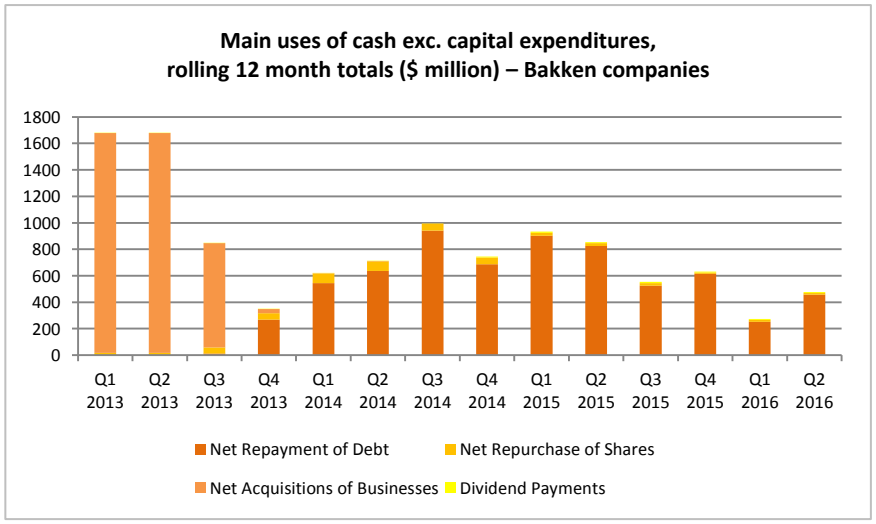


Appendix II – Charts, Bakken Companies

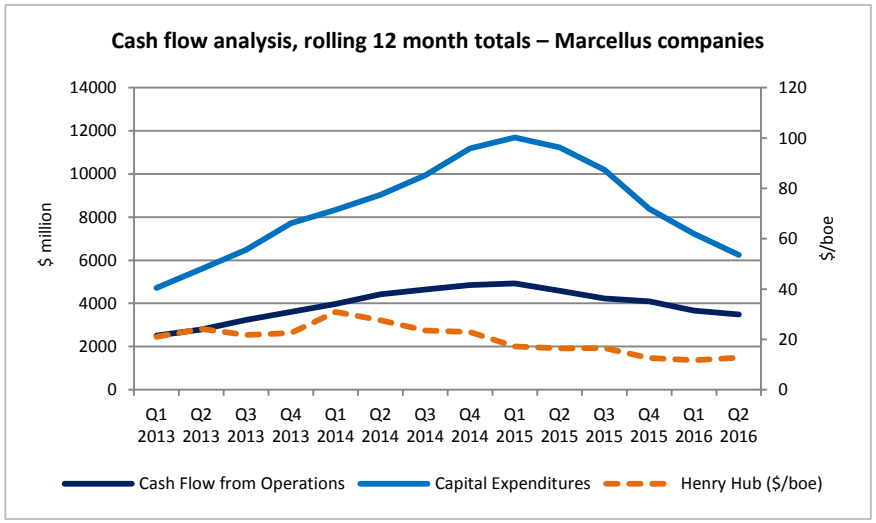


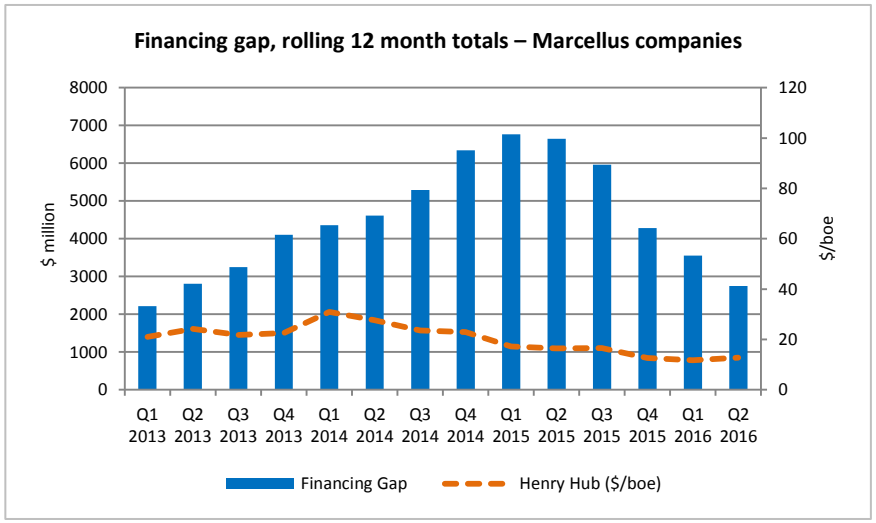


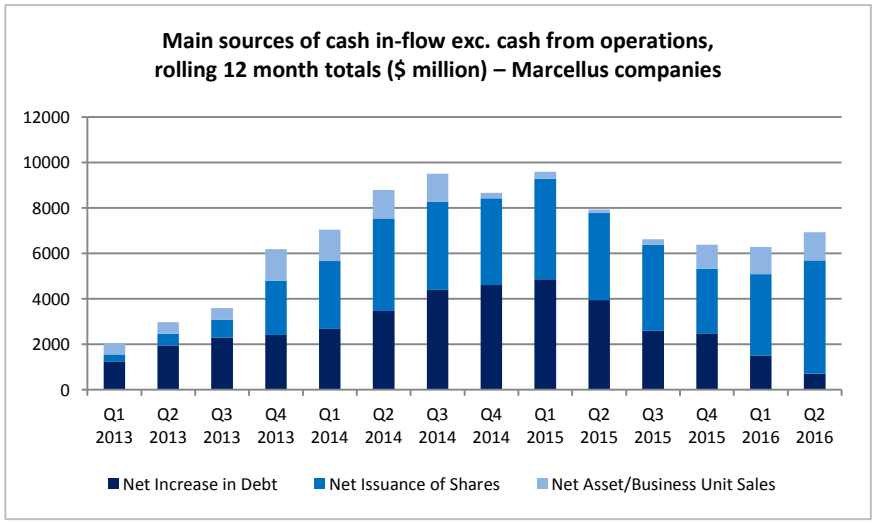


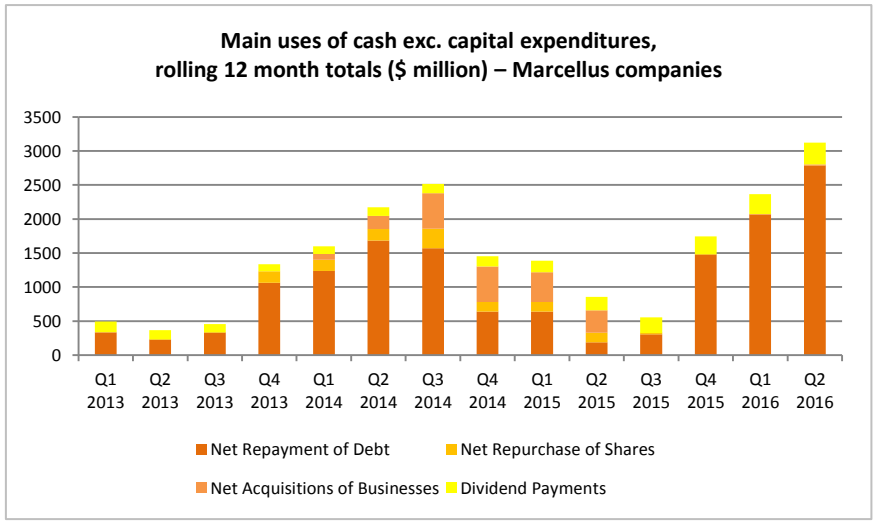


Appendix II – Charts, Marcellus Companies



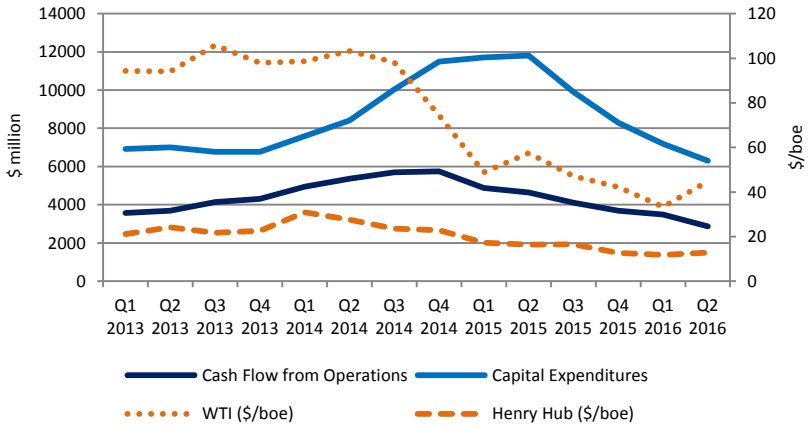




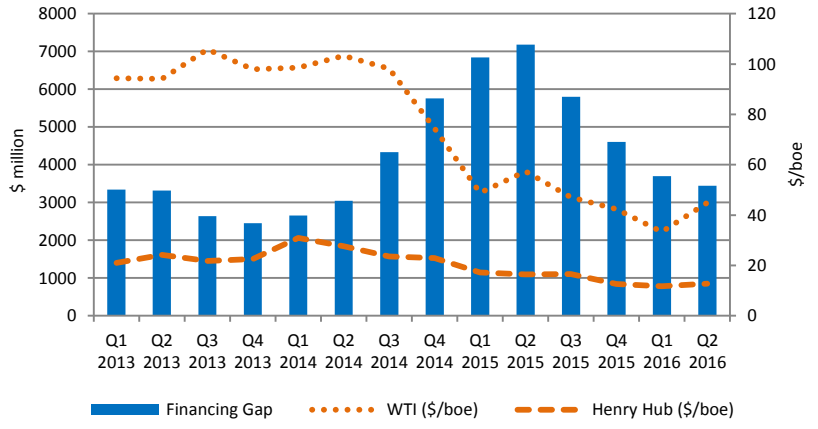


Appendix II – Charts, Permian Basin Companies

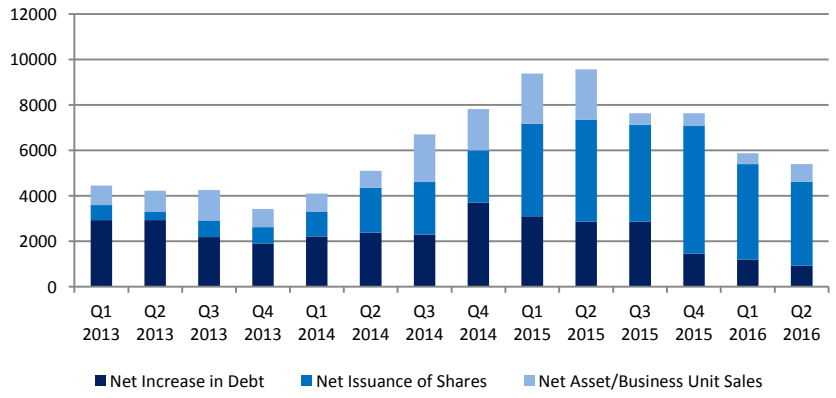
Cash flow analysis, rolling 12 month totals – Permian companies



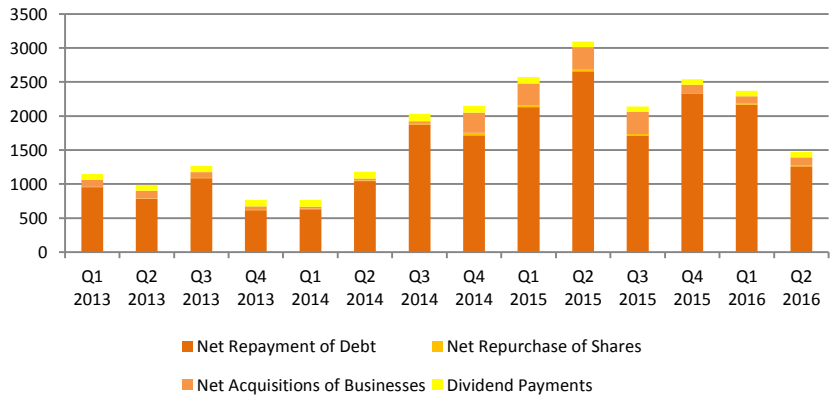
Financing gap, rolling 12 month totals – Permian companies



Main sources of cash in-flow exc. cash from operations, rolling 12 month totals ($ million) – Permian companies



Main uses of cash exc. capital expenditures, rolling 12 month totals ($ million) – Permian companies



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Phone

London - United Kingdom
+44 (0) 207 247 6120

Calgary - Canada
+1 (403) 269 6003

Houston - USA
+1 832-916-2465

E-Mail

Sales - energyinfo@evaluateenergy.com

Support - support@evaluateenergy.com