

The New Oil Order

Lower for longer to keep
capital sidelined

Commodities Research

Shale is creating a new more dynamic margin of adjustment

E&Ps can conserve cash as impressively as they can spend it

The search for a new equilibrium continues. Unlike in the past when the rebalancing took place primarily in the 'physical' and 'paper' markets, in the current environment, the 'capital' markets are playing the dominant role. This new source of adjustment is generating not only a high level of disorientation, but also the need to reassess the paradigm.

Faster 'time to build' makes capital the margin of adjustment

Previous paradigms were plagued with one simple problem: capital was slow to move due to the long time lag between capex and production. Capital investments are now a new margin of adjustment – a direct result of the collapsed time lag shale has created between when capital is spent and when production rises, as well as producers' ability, through very high decline rates, to quickly throttle back production when spending slows. With capital driving the adjustment process, the market has more levers to balance the market – credit, equity and cash flow.

The need for sidelined capital may force a U-shaped recovery

The credit, equity and oil price mix today is likely appropriate to achieve the slowdown in supply growth needed to balance the global oil market by 2016. Overall capex in the US E&P sector is down 25% – a further decline from 12% in mid-December – and drilling has dropped more quickly than in previous bear markets. But the short-cycle nature of capital investments in shale requires that such pressure remain in place long enough to also sideline the large amount of low cost capital available today. Because shale can rebound quickly once capital investments return, we now believe WTI needs to trade near \$40/bbl for most of 1H15 to keep capital sidelined.

The one-year ahead one-year swap is a market anchor

Excess storage and tanker capacity suggests the market can run a surplus for a very long time, preventing storage blowouts and a collapse in cash prices. This leaves cash prices as a simple storage arbitrage to the forwards. As producers hedge 9-12 months out, new capital primarily focuses on the 12-24 month strip, making this the new market anchor that enables the capital markets to balance the future physical markets. To keep capital sidelined, this strip needs to remain well below our revised 'new normal' WTI estimate for the marginal cost of production of \$65/bbl.

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Executive Summary

1. The search for a new equilibrium in oil markets continues. Unlike in the past when the rebalancing took place primarily in the 'physical' and 'paper' markets, in the current environment, the 'capital' markets are playing the dominant role.
2. Previous periods of adjustment were plagued with one simple problem: capital was slow to move due a long lag between capital expenditures and production. Capital investments are now a new margin of adjustment – a direct result of the collapsed time lag shale has created between when capital is spent and when production rises, as well as producers' ability, through very high decline rates, to quickly throttle back production when spending slows.
3. The credit, equity and oil price mix today is likely appropriate to achieve the slowdown in supply growth needed to balance the global oil market by 2016. Overall capex in the US E&P sector is already down 25% – a further decline from 12% in mid-December. The industry's aggressive capital structure requires it to do so, with high yield defaults potentially beginning if prices were maintained at \$40/bbl for 6 months with no cash conservation. The more credit intensive companies are already in maintenance mode where cash is being reserved for maintaining fields only. We now expect US supply growth to slow to 400,000 b/d yoy by 4Q15.
4. However, supply tends to rise more quickly than it falls in response to investment. As a result, the short-cycle nature of capital investments in shale requires that such pressure remain in place long enough to keep capital sidelined while the market rebalances, creating a more U-shaped type of recovery in prices. The large availability of low-cost external capital from either private equity or international majors exacerbates this need for sustained low prices to keep these assets from quickly being redeployed in a lower cost environment. This is the other side of short-cycle production – it can and will come back very quickly with access to capital – suggesting that even OPEC should not be a second mover (we no longer see any response from core-OPEC).
5. To keep all capital sidelined and curtail investment in shale until the market has rebalanced, we believe prices need to stay lower for longer. As short cycle shale producers typically hedge out 9-12 months, E&P capital primarily focuses on the 12 to 24 month strip in making investment decisions. As a result, the market anchor is shifting to this 'one-year-ahead' swap which creates the level of investment to balance future physical markets. We therefore believe it is this forward price that needs to remain below full-cycle costs to curtail investment, not the spot price.
6. Due to significant cost deflation and efficiency gains, we are lowering our estimate for marginal costs to \$65/bbl and \$70/bbl for WTI and Brent from \$80/bbl and \$90/bbl, respectively. These are our new 'normal' price forecasts. As a result, we forecast that the one-year-ahead WTI swap needs to remain below this \$65/bbl marginal cost, near \$55/bbl for the next year to sideline capital and keep investment low enough to create a physical rebalancing of the market.
7. After a decade of investment, substantial excess storage and tanker capacity suggests the market can run a surplus far longer than it has in the past, likely preventing storage blowouts and a collapse in cash prices. This leaves cash prices as a simple storage arbitrage to the one-year-ahead swap. Although logistical issues to get the surplus oil in the right geographical locations may create volatility in timespreads, ultimately we estimate that there is sufficient capacity to store a 1.0 million b/d surplus for nearly a year. We expect the US to be the last region to fill and the WTI-Brent spread to widen in 2Q15 as discounted US crude prices and strong margins lead US refineries to export the glut to the other side of the Atlantic.

8. Once a 2H15 US supply growth slowdown is more certain and given the very high decline rates on US production, renewed Libyan disruptions and an already visible demand response in the US, we expect the market to rebalance with inventories drawing rapidly from 3Q15 onwards. To accommodate the substantial expected first half inventory build and using the storage arbitrage to the one-year ahead swap, we are revising down our 3-, 6- and 12-month price forecasts for Brent to \$42/bbl, \$43/bbl and \$70/bbl, respectively, from \$80/bbl, \$85/bbl and \$90/bbl, and for WTI to \$41/bbl, \$39/bbl and \$65/bbl from \$70/bbl, \$75/bbl and \$80/bbl. The later expected trough in WTI prices is due to excess US storage capacity.
9. A new industry will likely be born out of this environment with lower costs driven not only by cost deflation in other commodities, currencies, rig rates and oil services but also by substantial productivity gains created by engineers facing tighter margins. Importantly, while shale is the marginal barrel today, we don't believe it will represent the marginal project tomorrow. Now that shale has risen to be the dominant technology in an industry facing cost deflation, efficiency gains and margin compression, companies are entering a more risky environment. Capital rebalancing includes the need to match high-quality assets with more conservative capital structure and to discard high-cost deepwater, oil sands assets and other alternative technologies to make the industry more efficient. We believe, however, this is unlikely to occur for another year or more.

Exhibit 1: We now see prices staying lower for longer to keep capital sidelined
\$/bbl

	WTI			Brent			WTI-Brent		
	New	Old	Forwards	New	Old	Forwards	New	Old	Forwards
1Q15	46.00	75.00	49.00	47.00	85.00	51.50	-1.00	-10.00	-2.50
2Q15	40.50	70.00	50.00	42.00	80.00	52.50	-1.50	-10.00	-3.00
3Q15	44.00	75.00	50.50	48.00	85.00	53.50	-4.00	-10.00	-3.00
4Q15	58.00	75.00	51.50	64.50	85.00	55.00	-6.50	-10.00	-3.50
1Q16	65.00	80.00	52.00	70.00	90.00	56.00	-5.00	-10.00	-4.00
2Q16	65.00	80.00	53.00	70.00	90.00	57.00	-5.00	-10.00	-4.00
3Q16	65.00	80.00	53.50	70.00	90.00	58.00	-5.00	-10.00	-4.50
4Q16	65.00	80.00	54.00	70.00	90.00	58.50	-5.00	-10.00	-4.50
2015	47.15	73.75	50.25	50.40	83.75	53.15	-3.25	-10.00	-3.00
2016	65.00	80.00	53.15	70.00	90.00	57.40	-5.00	-10.00	-4.25

Source: CME, ICE, Goldman Sachs Global Investment Research.

Lower for longer to keep capital sidelined

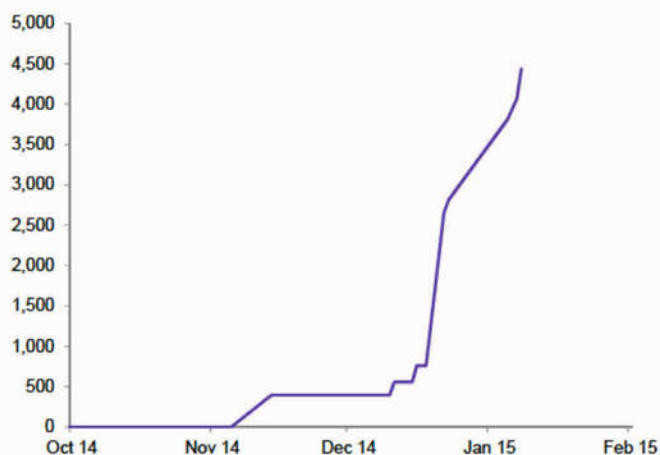
The search for a new equilibrium in the oil market continues. Unlike in the past, when the rebalancing took place primarily in the ‘physical’ and ‘paper’ markets, today the ‘capital’ markets are playing the dominant role. This new source of adjustment is generating not only a high level of disorientation, but also the need for an entirely new paradigm from which to view these markets. It is typically such periods of price stress that bring to the forefront new margins of adjustment that can lie dormant until the system is forced to adjust.

The modern oil market became apparent in 1973 with the rise of OPEC as the swing producer which forced a clearing price on the market. Before then the price of oil was simply a meaningless internal transfer price for integrated oil. In 1986, when surplus non-OPEC oil needed to find a home, the ‘commodity trader’ replaced OPEC’s official price with financial intermediation. This gave birth to liquid futures markets where risk transference and storage arbitrage played an important role in the adjustment process. This lasted until 2004 when the ‘commodity investor’ turned long-dated oil prices into an equity-like instrument to anticipate surpluses and deficits in an attempt to smooth the adjustment process.

Each subsequent paradigm sped up the adjustment process, making it more dynamic and efficient. However, each adjustment process was plagued with one simple problem: capital was slow to move due a long time lag between capital expenditures and production – even Saudi Arabia cut supply against committed capital. **Capital investments are now a new margin of adjustment – a direct result of the collapsed time lag shale has created between when capital is spent and when production rises, as well as producers’ ability, through very high decline rates, to quickly throttle back production when spending slows.** US E&P companies are beginning to show an ability to conserve cash that is as impressive as their ability to spend it, creating a rebalancing process through ‘short-cycle capital’ that can impact physical production rather rapidly, just like in manufacturing. Further, as capital markets now drive the adjustment process, they provide more levers for the market to pull to create rebalancing – credit, equity and cash flow.

Exhibit 2: The speed and volume of US E&P capex reductions so far is unprecedented

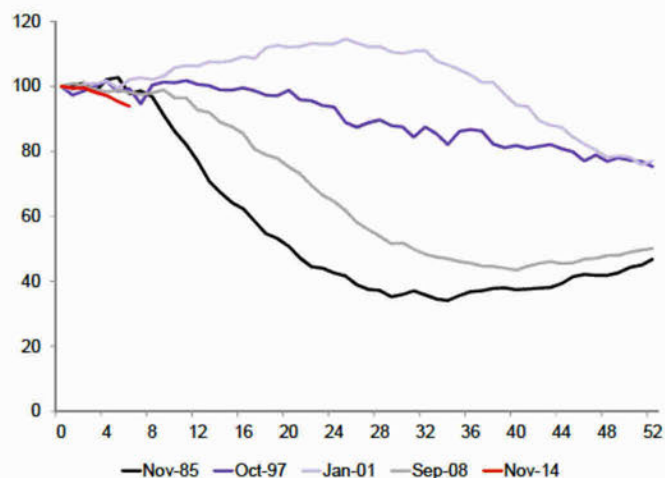
Cumulative cuts in US E&P 2015 capex (million \$)



Source: Company data.

Exhibit 3: The US rig count drop is faster and larger than in any other bear market

Indexed US oil rig count (100 as of peak) vs. weeks from peak



Source: Baker Hughes.

Overall capex in the US E&P sector is already down 25% – a further decline from 12% in mid-December. This is because the industry’s aggressive capital structure requires it to reduce capex given potentially high yield defaults if prices stay as low as – or lower than – \$40/bbl for 6 months and cash isn’t conserved (the average E&P in our equity and credit coverage is about 1 turn more levered than entering the 2008/09 downturn). In response, the more credit intensive companies are already in maintenance mode, with cash being reserved only for maintaining fields. This has already translated into the fastest decline in drilling due to lower prices than the industry has ever seen.

This also suggests that the market is likely near the appropriate credit, equity and oil price mix to achieve a sufficient slowdown in US production growth to balance the global oil market by 2016. **However, the short-cycle capital nature of shale requires that such pressure remain in place in the coming months, likely creating a more U-shaped type of recovery with more downside risks.** The significant availability of low-cost external capital from either private equity or international majors exacerbates the need for sustained low prices to avoid these assets from quickly being redeployed in a lower cost environment (the 500bp increase in cost of high yield E&P funding since last summer is equivalent to an additional \$3-5/bbl further decline in oil prices on a 50% debt funded well). This is the other side of short-cycle production – it can and will come back very quickly with access to capital – suggesting that even OPEC should not be a second mover (we no longer see any response from core-OPEC).

To keep all capital sidelined and curtail investment in shale until the market has rebalanced, we believe prices need to stay lower for longer. As short cycle shale production is a 12 month investment proposition, producers typically hedge out 9 to 12 months. As a result, fresh E&P capital primarily focuses on the 12 to 24 month strip in making investment decisions. As a result, the market anchor is shifting to this ‘one-year-ahead’ swap which creates the level of investment to balance future physical markets. It is therefore this forward price that needs to remain below full-cycle costs to curtail investment, not the spot price. Due to significant evidence of cost deflation and efficiency gains, we are lowering our estimates for the marginal cost of production to \$65/bbl and \$70/bbl for WTI and Brent from \$80/bbl and \$90/bbl, respectively. These are our new ‘normal’ price forecasts. As a result, we forecast that the one-year-ahead WTI swap needs to remain below the \$65/bbl marginal cost, near \$55/bbl for the next year to sideline capital and keep investment low enough to allow for a physical rebalancing of the market.

After a decade of investment, substantial excess storage and tanker capacity suggests the market can run a surplus far longer than it has in the past, likely preventing storage blowouts and a collapse in cash prices. This leaves cash prices as a simple storage arbitrage to the one-year-ahead swap. Although logistical issues to get the surplus oil in the right geographical locations may create volatility in timespreads, ultimately we estimate that there is sufficient capacity store 1.0 million b/d surplus for nearly a year. We expect the US to be the last region to fill and the WTI-Brent spread to widen in 2Q15 as discounted US crude prices and strong margins lead US refineries to export the glut to the other side of the Atlantic.

Once a 2H15 US supply growth slowdown is more certain and given the very high decline rates on US production, renewed Libyan disruptions and an already visible demand response in the US, we expect the market to rebalance with inventories drawing rapidly from 3Q15 onwards. To accommodate the substantial expected first half inventory build and using the storage arbitrage to the one-year ahead swap, we are revising down our 3-, 6- and 12-month price forecasts for Brent to \$42/bbl, \$43/bbl and \$70/bbl, respectively, from \$80/bbl, \$85/bbl and \$90/bbl, and for WTI to \$41/bbl, \$39/bbl and \$65/bbl from \$70/bbl, \$75/bbl and \$80/bbl. The later expected trough in WTI prices is due to excess US storage capacity.

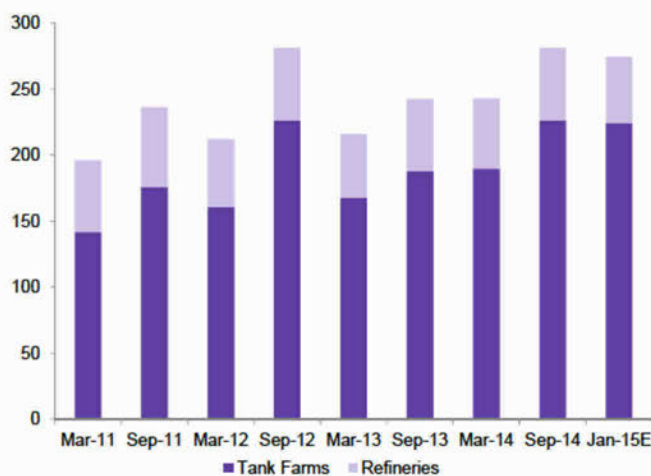
A U-shaped recovery: too much storage capacity, too many tankers and too much capital

With the exception of 1998 when a chain of emerging market crises created a deep and protracted U-shaped bear market recovery, almost all of the other bear markets in the modern oil market can be characterized as V-shaped. We believe this bear market will likely be characterized by more of a U-shaped recovery in which markets take longer to recover and will likely rebound to far lower price levels from where they sold off from. This is because the current industry has far greater storage and tanker capacity and a more aggressive capital structure than it had in the more recent past which diminishes the physical market's role and increases the capital market's role.

What was key to generating those relatively quick and physically driven V-shaped rebounds was a lack of storage capacity, tight freight markets and very conservative capital structures. All that was required was an inventory build large enough to breach on- and offshore storage capacity such that spot prices disconnected from forward prices and fell below cash costs. As supply growth hit a physical constraint by running out of both storage and demand capacity, it was forced to be shut-in. Combined with a demand response the market would quickly rebalance and push prices back to the old equilibrium. Because of the conservative capital structures, the physical stress would create a rebalancing before any significant sustained financial stress had a chance to materialize.

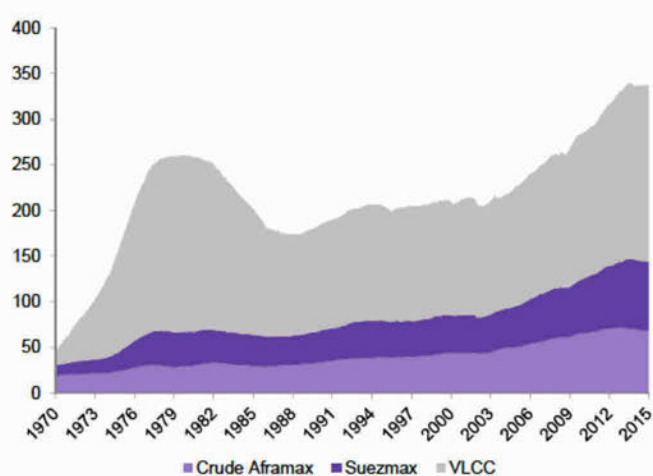
Today, the oil industry has more than adequate storage and freight capacity, which will allow it to run surpluses far longer than in the past, and very aggressive capital structures which suggest that it will run into financial stress far quicker than in the past. Not only has the US expanded storage capacity significantly, but Europe has also shuttered refining capacity that can be used as storage, and the global crude tanker fleet has grown by 100 million dwt since 2008 – while oil at sea has remained stagnant given the dominance of onshore drilling. We believe at least a 1.0 million b/d surplus can be maintained for a year before any significant problems would arise, precluding logistical dislocations as it takes time to get surplus oil and tankers in the right geographical location.

Exhibit 4: Excess US storage capacity is substantial and alone can accommodate a 500,000 b/d surplus for a year US spare capacity: onshore working storage capacity vs. ending stocks (tank farms and refineries, excluding leases and pipelines); millions of barrels



Source: US Department of Energy.

Exhibit 5: The global tanker fleet swelled in the late 2000s just as oil at sea stagnated with US domestic drilling Global crude fleet size (transportation & storage, million DWT)



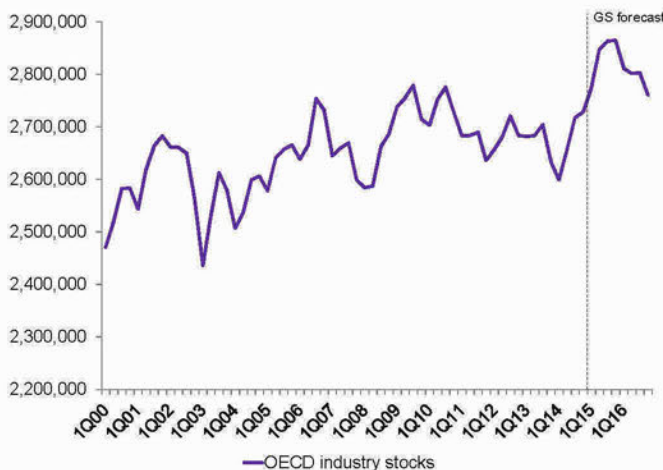
Source: Clarksons.

This suggests that the financial stress induced reductions in capex will create the rebalancing before the surpluses can do it by driving oil prices below cash prices. Specifically, our North American Energy equity research team led by Brian Singer estimates that a 30% decline in 2015 capex point to US Lower 48 oil production declining to 400 thousand barrels per day by 4Q15. Given our foreign supply and global demand expectations, this is sufficient to start drawing global inventories by 3Q15, with OECD inventories peaking above prior records in the face of higher storage capacity.

Because of the large capacity of the market to store oil, the spot price should trade a full carry arbitrage relative to the forwards. While logistical bottlenecks are likely to generate occasional volatility, timespreads are unlikely to blowout significantly as they did in 2008/09 or in 1998/99 absent a demand shock in 2015. In other words, crude oil is likely to trade more like aluminum where unconstrained storage capacity creates a very stable contango market that can be extremely persistent. However, what makes oil very different and the bear markets far shorter are the high decline rates and lower shut down costs that makes shuttering fields more attractive more quickly than in aluminum.

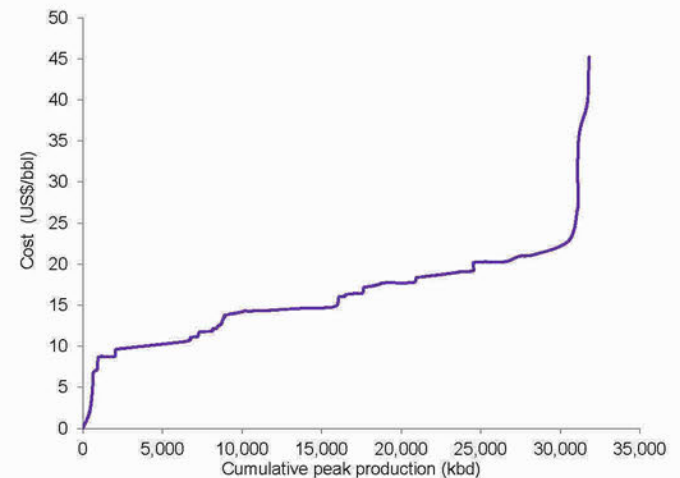
Our expectations are that the oil market could remain in a deep contango for about a year without hitting any significant storage constraints. While history would suggest that a storage blowout would push spot prices below \$35/bbl, we believe that by avoiding breaching storage capacity, the market will hover around \$40/bbl, potentially dipping at times into the high \$30/bbl which we see as the likely lows of this cycle. Importantly, this remains above the price of shut-in and default which would need to be well below operation costs although wide crude differentials to the coasts may create such outcomes for the most expensive Canadian or US wells.

Exhibit 6: The inventory build will likely avoid breaching storage capacity constraints before drawing OECD industry stocks (thousands of barrels)



Source: International Energy Agency, Goldman Sachs Global Investment Research.

Exhibit 7: Cash operating costs are still very low for most of the market except EOR and oil sands
Non-OPEC reported cost of production (\$/bbl)



Source: Company data, Wood Mackenzie, Goldman Sachs Global Investment Research.

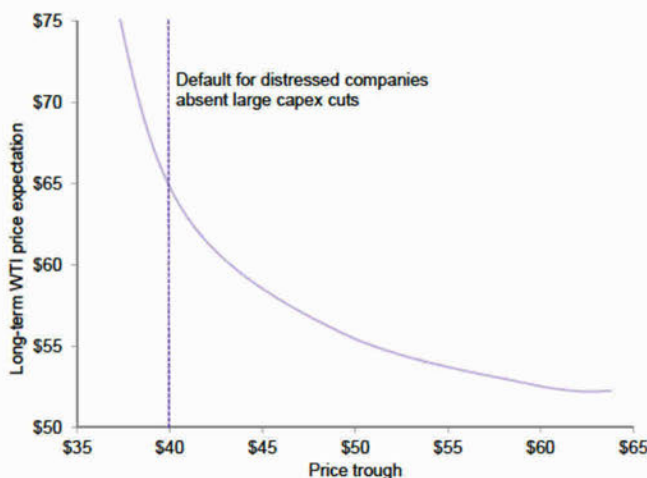
Cost deflation and industry rationalization creates a recovery to a far lower equilibrium

The ability of the market to run surpluses for longer than it could in the past, combined with the high decline rates of shale production suggest that capex and drilling reductions are likely to generate the rebalancing process before other adjustments. To create capital rebalancing, prices need to go low enough for long enough to generate a reduction in capital expenditures (which leads to a physical tightening six to twelve months later), followed by credit stress as prices fall lower until debt service becomes an issue, at which point the financial stress begins to create a price floor around \$40/bbl. Along with such a price floor should come a willingness to restructure; but as is often the case, prices may need to fall even lower to create a real response.

However, unlike physical stress, how low prices need to go is dependent upon the producer's view of the future and the persistence of the current low price environment. The lower and more persistent the producer views the future pricing outlook, the quicker the restructuring. Given the optimistic nature of the oil drilling business, producer views are unlikely to change until the environment becomes extremely hostile with prices low enough such that survival becomes questionable.

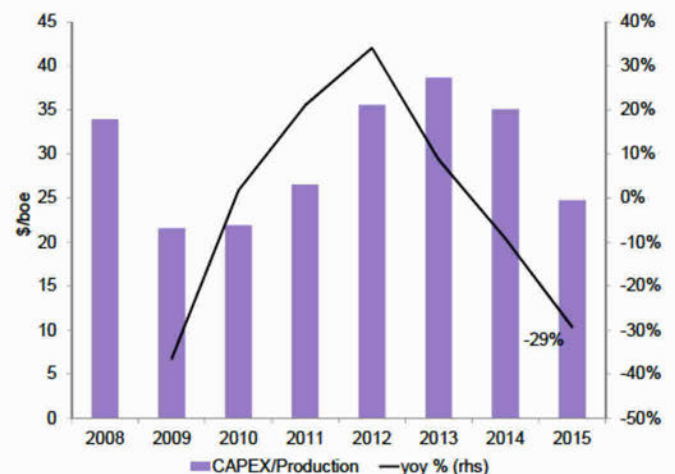
We believe a new industry will be born out of this environment with lower costs driven not only by cost deflation in other commodities, currencies, rig rates and oil services but also by substantial productivity gains created by engineers facing tighter margins. Although what exactly this new industry will look like is still extremely uncertain, we do know that cost deflation has already created a 25% reduction in expenses. Accordingly, to reflect cost deflation in the industry and its sustainability through significant efficiency gains, we are reducing our 2016 and long-term price forecasts to \$65/bbl and \$70/bbl for WTI and Brent from \$80/bbl and \$90/bbl, respectively.

Exhibit 8: The lower the belief in the persistency of the current environment, the lower current prices need to go \$/bbl



Source: Company data, Goldman Sachs Global Investment Research.

Exhibit 9: Large cost reduction potential although shale set to remain lowest cost
US oily shale companies with 2015 guidance - \$/boe



Source: Company data, Goldman Sachs Global Investment Research.

It is important to emphasize that aggressive capital structures were not irrational in our view. Capital structures became aggressive not only because the search for yield put a premium on high yield financing, lowering its cost, but also because it was the appropriate capital for the high growth and very aggressive companies that spawned the Shale Revolution as the industry searched for new sources of oil against a backdrop of high and rising prices. However, now that shale has risen to be the dominant technology in an industry facing cost deflation, efficiency gains and margin compression, companies are entering a far riskier environment, where such aggressive capital structures are likely to be made modestly more conservative with a greater emphasis on cash and equity. So the capital rebalancing also includes the need to match some of the good assets with more conservative capital structure and discard the poor assets and technologies to make the industry more efficient. We believe, however, this is unlikely to occur for another year or more.

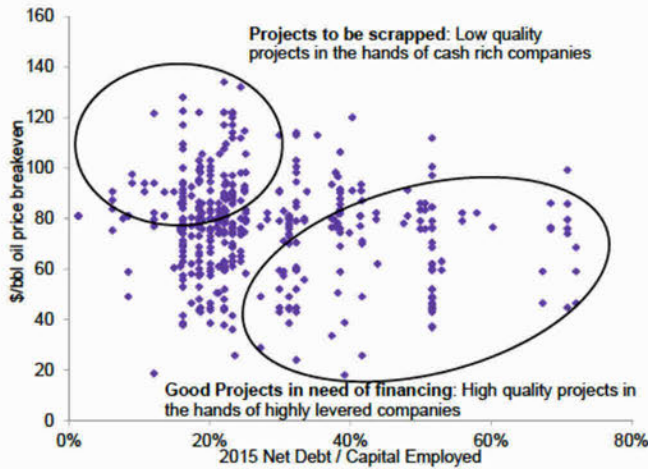
Although shale is the marginal physical barrel it is not the marginal future project

Despite being seemingly obvious, the realization that drilling in the ocean is far more expensive than drilling on land is really the key to the recent sell off, particularly for long-dated prices. Before July 2014, the market was supported on a longer-term basis near \$100/bbl by higher cost deepwater offshore and oil sands projects. As shale production surged in late 2013, it became increasingly clear that the size of the onshore resource base and the prolific nature of these projects made drilling in the sea and mining high cost oil sands a redundant more expensive source of supply. As these project economics became increasingly uneconomic, the market moved from pricing them at the margin to pricing shale at the margin, which created the initial re-pricing of long-dated prices from over \$90/bbl to under \$80/bbl.

This is very important for several reasons. First, when shale was intra-marginal, there were far fewer pressures for the producers to rationalize costs and operations as the higher cost deepwater projects kept the price far above producers' economics and producers avoided any real margin pressures. After nearly a decade of being intra-marginal, this created significant inefficiencies and fat in the system. As shale moved to the margin, all of these inefficiencies were exposed, and what the market is experiencing now is a rationalization of the shale industry as it adjusts to being the marginal project.

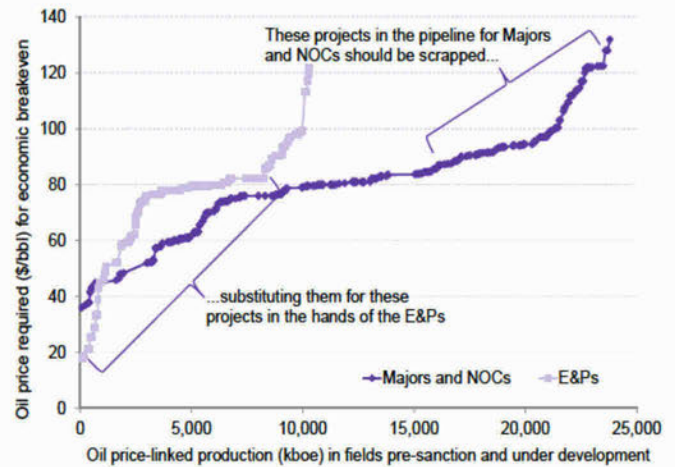
Second, on a longer-term basis these assets are relatively high quality despite some assets being held by relatively poor balance sheets and capital structures. Therefore, these higher quality assets are unlikely to be retired even if the owner is retired. Instead they are likely to be purchased by owners of other higher-cost, poor assets such as integrated or national oil companies with conservative capital structures and substantial cash reserves. And in place of these newly acquired assets, the new owners will likely focus on retiring higher cost, weaker assets in ex-US non-OPEC. This would give these more conservative companies a foot in shale, and they will likely operate the assets far more conservatively. In return they could scrap their less attractive deepwater, heavy oil and traditional alternatives and help find a new equilibrium with slower non-OPEC growth.

Exhibit 10: Assets need to be redistributed, so that high-quality projects low on the cost curve get the necessary funding, while high-cost projects are dropped
 Top 400 Projects breakeven vs. financial leverage of operator



Source: Goldman Sachs Global Investment Research.

Exhibit 11: The majors and NOCs may look to shift down the cost curve through M&A
 Cost curve for oil price linked projects (including LNG) under construction or pre-sanction split by majors/NOCs and E&Ps



Source: Goldman Sachs Global Investment Research.

The new short-cycle paradigm anchors the one year ahead one year swap or “one-year-ahead swap”

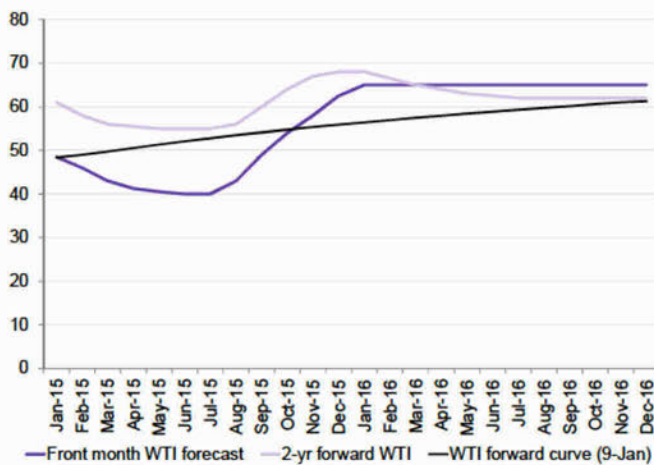
The fast-cycle nature of shale production, with its very quick response to increases and decreases in capex, suggests that once both oil prices and fundamentals begin to rebalance and recover, there becomes an increased likelihood that new capital will come into the market and kill off any material rise in oil prices through a rapid increase in supply. To prevent this from occurring, the forward prices need to drop to a level that slows investment as fundamentals and prices recover. We believe the correct forward is the one-year-ahead, one-year strip defined by the 12 to 24 month swap. The reason for this is that most short-cycle producers hedge the first 9 to 12 months of production and are more exposed to the prices 12 to 24 months ahead. In addition, given the fast-cycle nature of the production, the ROE’s are mostly determined over the course of one year.

This suggests a shift in the market anchor which has historically either been very near-dated or very long-dated. The OPEC driven market was a cash market, the commodity trader market was a three-month market, and the commodity investor market was very long-dated. The new short-cycle market is more of a middle-dated driven market with the cash price simply a storage arbitrage to the one-year-ahead swap that US E&P producers target in their budgeting decisions. To account for an expected recovery in oil prices later this year, we have also embedded a forecast path for the one-year-ahead swap, which we expect to drop low enough by the summer to create a sustainable recovery by attempting to discourage further short-cycle investments, particularly given the large pools of capital that are currently sidelined, from entering this market.

For 2016, we believe that increased investment and hedging will push back down this deferred incentive price to limit blowing back into surplus in 2017. Importantly, once the current surplus overhang clears, we believe this new short cycle paradigm will create a more persistent backwardation in the oil forward curve given the need for: (1) the industry to hedge in what is likely to be a more risky environment and (2) the middle-dated price to regulate capital flows into the industry. This was ultimately one of the reasons why the deferred WTI oil curve was in a more persistent level of backwardation than the Brent curve post the debottlenecking of the Midcontinent.

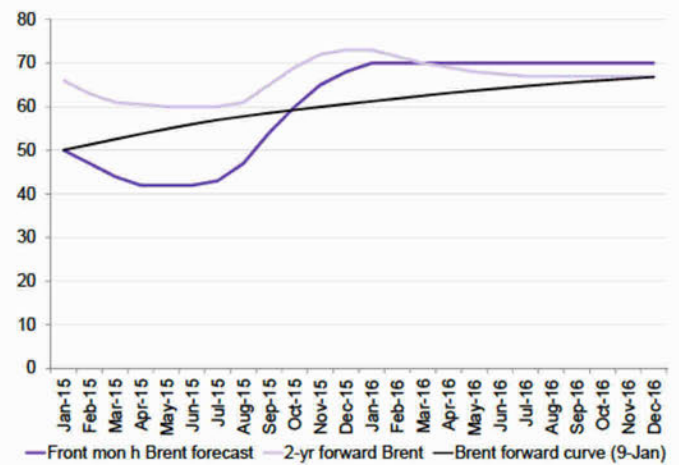
As we have long argued, this risk transference through hedging from producers to investors will likely provide a consistent source of returns for commodity investors once fundamentals rebalance. In the meantime and until likely mid-year, our forecast points to a large carry in the WTI and Brent forward curves as well as declining prices. Both of these expectations would benefit a short GSCI-type rolling future position on either contract.

Exhibit 12: Lower one-year-ahead swap prices required... \$/bbl



Source: CME, Goldman Sachs Global Investment Research.

Exhibit 13: ...to achieve the necessary rebalancing \$/bbl



Source: ICE, Goldman Sachs Global Investment Research.

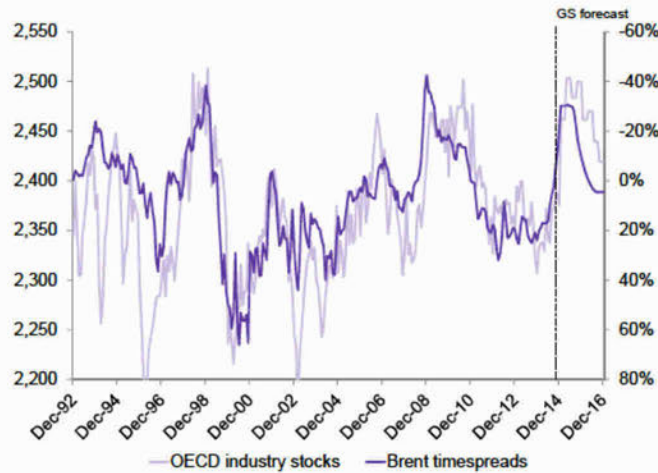
Although US onshore shale production is at the root of the current surplus, the crude glut currently resides beyond US shores on the other side of the Atlantic. This is because the post de-bottlenecking, the US Midcontinent has become extremely efficient at converting crude oil to product and exporting the products into the Atlantic basin. As European refineries were squeezed by these abundant product exports, the regional crudes started to back up during the summer months. This was reflected in the fact that Brent shifted into contango back in July long before WTI did.

More recently, the combination of the Middle East defending market share in Asia, Libya ramping up briefly but sharply and North America displacing light crude imports from West Africa, has exacerbated the already developing crude overhang in the Atlantic basin. As a result, Brent timespreads today are weaker than WTI timespreads while the LLS-Brent spread is compressing to incentivize more crude to accumulate in the US, through higher imports, as significant low cost onshore storage remains available in the US.

We expect this to continue in the coming months, sustaining a narrow WTI-Brent differential. However, as US domestic crude oil production continues to grow, not only strongly in 1H15 but also medium-term, we expect US storage to fill with the export ban (which we assume remains in place at least in 2015-16) hindering the drain in US inventories once the global crude market starts to clear.

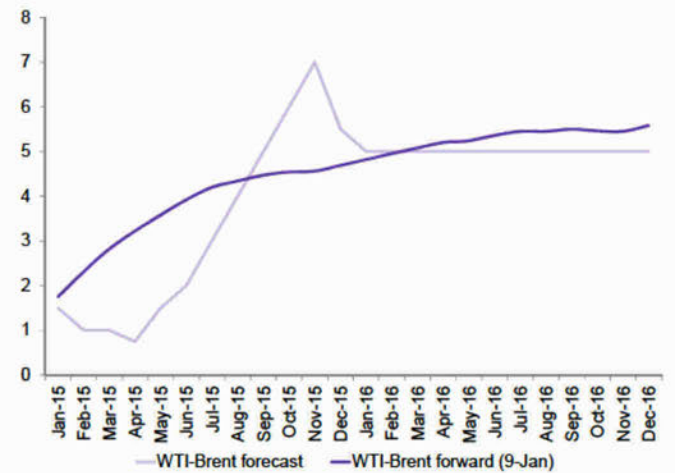
As a result, we expect the WTI-Brent differential to widen from mid-year 2015, reaching its widest level during this coming fall refinery turn-around window. Importantly, the modest expected increase in US refining capacity in 2015 and 2016 will likely leave the US market still net long crude at our expected lower US production growth pace of 450 thousand barrels per day in 2016. For 2016, we forecast a \$5/bbl Brent-WTI spread, evenly split between WTI-LLS and LLS-Brent. This reflects both the required incentive to send crude from the US Midcontinent to the USGC as well as the need for USGC prices to disincentivize imports and incentivize exports to Canada.

Exhibit 14: Available global storage capacity should prevent a blowout in timespreads
 OECD commercial inventories (exc. US NGLs and 'other products', in million bbls); Brent timespread 1m – 5y (%)



Source: IEA, JODI, EIA, ICE, Goldman Sachs Global Investment Research.

Exhibit 15: Available US onshore storage capacity should keep the WTI-Brent differential narrow at first
 \$/bbl



Source: CME, ICE, Goldman Sachs Global Investment Research.

A fast-cycle large surplus

We update our 2015-16 global crude supply-demand expectations to reflect stronger production growth heading into 2015 but a sharper slowdown in 2H15 (see *The New Oil Order*, October 26, 2014 for our prior expectations). We also maintain our expectation that demand will accelerate on the combination of lower prices and stronger global economic activity.

- **Stronger North American crude oil production growth in 4Q14 but a sharper decline in 2H15.** We raise our US production level in 1H15 but higher capex cuts translate into a sharper slowdown in production both in the US and Canada. We see downside risk by year-end to our expectation that Canada's production continues to grow 100 kb/d.
- **Small reductions to the rest of non-OPEC.** We trim production growth expectations in Brazil, Azerbaijan, and Kazakhstan from 2H15 with higher decline rates in Mexico pushing production even lower. We still expect Russian production to grow slightly as Ruble depreciation helps offset lower oil prices (see *Russian upstream: Myths and realities* from our Russian Energy equity analyst, Geydar Mamedov from December 19, 2014).
- **No cut from core OPEC.** We now expect that Saudi/core OPEC will not cut production to help balance the market vs. our prior expectation that OPEC would help balance the oil market in 2H15 once it became apparent that US shale production growth was slowing. This is anchored on our expectation that the slowdown in US shale oil production in 2H15 will be sufficient to clear the market overhang and the threat of capital being quickly redeployed to restart US production growth.
- **Lower Libyan production.** The recovery proved short-lived with the current conflict escalation limiting the potential for another recovery in the coming months. We tentatively assume production at 300 kb/d in 1Q15 and 450kb/d afterwards.

- Higher Iraqi production.** Following the November deal between Baghdad and the KRG, Northern exports picked up in December with potential for further increases after the expansion of the Kurdish pipeline. Further, Southern exports reached recent record highs in December, finally suggesting that expanded capacity was operational. Although we expect monthly exports to remain volatile, we raise our 2015 production growth forecast to 300 kb/d. For now we continue to expect no deal with Iran and flat production.

Still expecting oil demand to recover. While sentiment so far this year has focused on the potential downside risks to the global economic outlook – on European stresses, recent marginally softer US data and fears over EM commodity producers – our economists continue to expect sequentially stronger growth in 2015. While our modeling suggests that lower oil prices should further support the oil demand recovery, with recent US demand numbers supporting that view, we acknowledge the downside growth risks. As a result, our 2015 global oil demand growth forecast of 1.35 million barrels remains 200 thousand barrels short of our projection of oil demand modeled on GDP growth and Brent oil prices. Lower demand growth than we currently expect would require lower prices for longer to further slow US production growth.

Net, we expect that the global market imbalance will be larger in 1H15 than we had previously expected with global inventories growing by nearly 1.1 mb/d on average. After peaking at a higher level, we now expect inventories to draw faster on a sharper slowdown in US shale oil production.

Exhibit 16: Accelerating global growth and lower oil prices should support oil demand

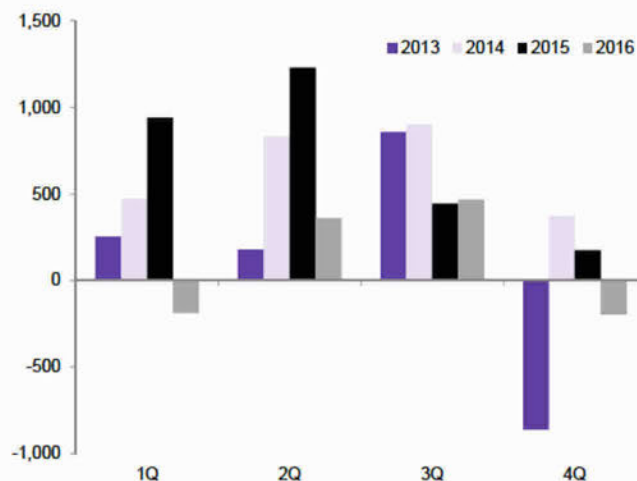
Estimated changes in global oil demand growth (thousand barrels per day, vs. prior 3.5%-\$85/bbl assumption)

		2015 global GDP growth			
		3.00%	3.25%	3.50%	3.75%
2015 Brent	40	60	140	220	300
	60	-40	40	120	200
	85	-160	-80	0	80
	100	-235	-155	-75	5

Source: ICE, IEA, Goldman Sachs Global Investment Research.

Exhibit 17: We now expect a sharper rise and subsequent fall in global oil inventories

Quarterly global oil market imbalance (thousand barrels per day)



Source: IEA, JODI, EIA, Goldman Sachs Global Investment Research.

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Reg AC

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