

IMPLICATIONS OF THE COMING **SHORTAGE OF OIL**

Market Viewpoint: April 8, 2016

The astonishing boom in U.S. oil production growth in recent years has upended global energy markets, leading to a massive supply glut and a collapse in prices. But we see the set up for a trend reversal that will create a supply shortage much faster than analysts expect. Here are the key reasons why we think prices are heading sharply higher, as further detailed in the pages that follow.

COLLAPSING GLOBAL INVESTMENT

Recent U.S. data show crude production has fallen to its lowest point since late 2014. U.S. rig counts are down more than 75% from the peak. Worldwide exploration and production spending is on course to decrease by 20% this year alone.

OPERATIONAL HEADWINDS FOR "NIMBLE" PRODUCERS

In a tight labor market with a 5% unemployment rate, re-hiring laid-off workers as dormant wells come back online will be challenging: most are already looking for jobs outside of the energy industry. Furthermore, oil companies are having increasing difficulty accessing adequate financing: a third of U.S. producers may face bankruptcy as banks tighten credit lines.

BOOMING DEMAND

Cheaper gas means Americans are driving more, with U.S. gasoline consumption expected to hit record highs this summer.

WEAKER DOLLAR

The U.S. dollar should [continue to roll over](#) as inflation surges from higher energy prices and rising goods and services. As the Fed continues to raise rates in Ms. Yellen's often stated gradual manner, the inflation-adjusted fed funds rate will quickly become deeply negative. The dollar will fall and the rebound in oil prices will accelerate.

NEW MRP THEME

As oil prices have fallen, the XLE energy ETF has plunged 35% since June 2014 and almost 50% peak-to-trough. Sub-sectors like Oil & Gas Producers have plunged more than 70%. A recovery in product prices could lead to some whopping gains in stock prices. Indeed, we expect that energy could be a top performing sector in the next few years. **MRP is adding the Energy sector at this point as an active theme.**

See below for the full report:



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"The drastic reduction in E&P spending ... will shrink oil service capacity so much that future demand growth will not have adequate support."

It's official: The International Energy Agency (IEA) has recently proclaimed the February 11th low to be the bottom for oil prices! At least that's the way many media headlines have reported it. Actually, what the IEA said was "prices might have bottomed out"; MRP concurs with this more qualified statement. We too think oil prices most likely have bottomed. But here's where we differ from the consensus: we believe prices are likely to be driven significantly higher by outright shortages of crude in 2017.

Though there is growing agreement about a bottom in oil prices, theories and predictions about the path of oil prices from here have diverged. For example: A recent report published by the consultancy firm, Oliver Wyman, sees the current oil bust as a fundamental shift in the industry – a new normal of indefinitely low oil prices. The writers contend that American oil and gas producers, have initiated a new paradigm in which, as "traditional producers freeze production and allow prices to go up, shale disruptors will become competitive and simply rush in to fill the void and eat up their market share" – keeping prices depressed. On the other hand, the IEA sees prices steadily rising in accordance with a rebalancing of supply and demand in 2017. They foresee a potential "risk of a sharp oil price rise ... from insufficient investment" by the end of the decade.

"We see the same risk of a sharp oil price rise, but expect it to play out faster and sooner than most now expect."

We see the same risk of a sharp oil price rise but expect it to play out faster and sooner than most now expect, beginning in the second half of 2016. What follows is a closer look at the moving parts in the global energy story.

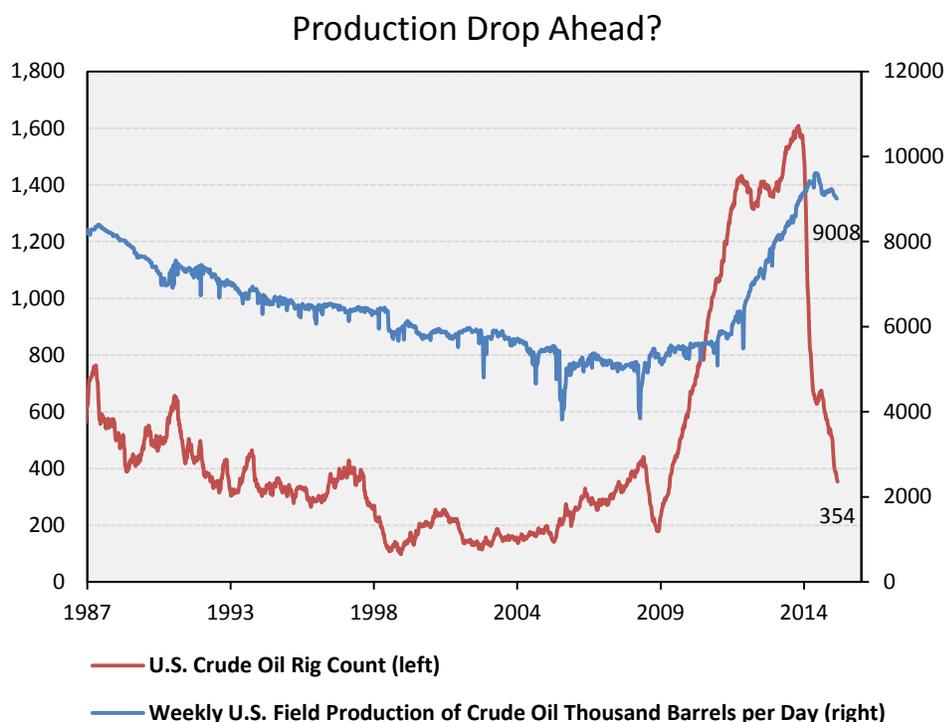
A BIT OF HISTORY

At the heart of the supply glut buildup and dramatic drop in oil prices is energy technology, faulty forecasts, and weakness in the world economy. Just prior to the financial crisis when oil was trading at \$140/bbl, some experts were predicting it would rise to \$200/bbl. The logic was that supply would not be able to keep up with increasing demand from developing countries. Flush with capital and with forecasts predicting demand outpacing supply, especially in Asia, global energy companies moved to preempt the surging demand by increasing capital expenditure investments, particularly on the production technology front.

Higher oil prices at the end of the last decade made oil shale breakeven costs attractive. Petroleum engineers, chemists, physicists, and geologists developed new sophisticated drilling and extraction techniques with the objective to increase efficiency. Although oil prices rose as the marginal cost of producing incremental barrels went up, the industry succeeded in its goals of making oil production into a science -- yielding significant efficiency gains. This phenomenon coupled with underlying shifts in demand, a burgeoning alternative energy sector, political intervention, a strong U.S. dollar, and unusual weather worked in sync to create the significant supply/demand imbalance wreaking havoc on crude prices today. In spite of these headwinds, many including the IEA have cited several reasons why a bottom in oil prices has already occurred -- including a potential agreement for an oil production freeze by OPEC, diminishing non-OPEC production, robust oil demand growth, and a reversal of the four-year U.S. dollar uptrend.

SUPPLY

The U.S. is now the largest source of supply growth and the largest producer by volume outside of OPEC. U.S. production doubled in half a decade making it one of the primary causes of the current supply glut. Production of light tight oil (LTO) began accelerating in 2009, until mid-2015. LTO production in 2015 added 4.3 mb/d, nearly ten times more than what was added in 2010. The supply growth of LTO alone made up 40% of the non-OPEC supply increase in 2015. This massive effort by oil and gas companies, fueled by enormous debt and equity offerings, created 55,000 new wells during that five-year span. Furthermore, the U.S. active rig count, reaching its peak in 2014 of more than 1,500, in comparison, greatly outnumbered Saudi Arabia's 150 rigs – starkly underpinning the gains made by U.S. producers.



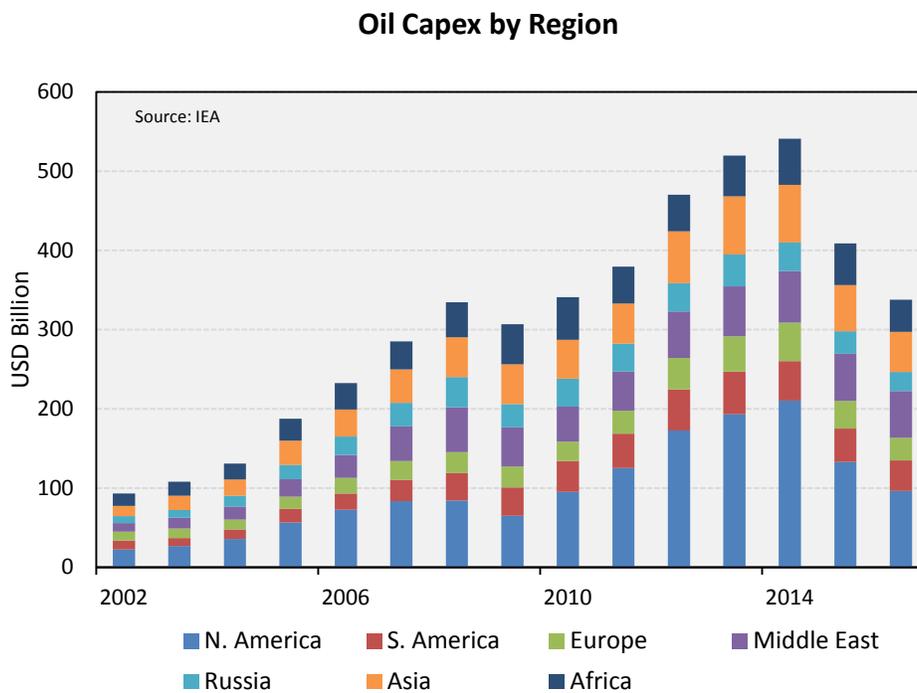
The explosion in U.S. oil production growth in recent years has had a dramatic effect on current record supply levels. The most recent U.S. Energy Information Administration (EIA) Petroleum Status Report showed U.S. crude inventories have risen to an 80-year record of 529.9 million barrels. The IEA believes that over the next seven years overall U.S. supply growth will remain positive but at a more moderate rate. In the short-term, recent U.S. data shows crude production has fallen to its lowest point since late 2014. Still, though production is decreasing, the spread between WTI and Brent crude is not trading at a wide enough gap to discourage oil imports. The rise in imports offsets the domestic supply contraction generated by sharp production cuts. Adding further strain to the inventory levels is the shape of the oil futures curve, which at present is in contango. Various oil market players including large oil companies, airlines, and futures traders are buying crude oil barrels and selling them forward. These barrels have to be stored in the meantime until delivery.

But now, since peaking in late-2014, the U.S. rig count has fallen by more than three-quarters, and yet, U.S. oil production has not fallen as much as one would think. Production is down 7% from its peak last year, but still remains 62% above output half a decade ago. Rather, oil well initial production rates, spurred by technological advances such as hydraulic fracturing, horizontal drilling, and 3D seismic imaging, increased significantly. Just in 2015 alone, initial production rates of new wells increased by 12% in the Bakken and Eagle Ford regions while in West Texas it was up 23%. In addition to efficiency gains in extraction, the cost to drill new oil and gas wells has fallen by a steep 26% since the peak in 2014. Break-even prices in the U.S. and globally have fallen considerably due to the introduction of more efficient drilling systems, new techniques, and growing experience. Rystad Energy estimates that breakeven prices fell by 15-25% in 2015 alone, and gains are likely to continue in 2016. It would seem that the ability of oil producers to operate and be profitable at lower prices

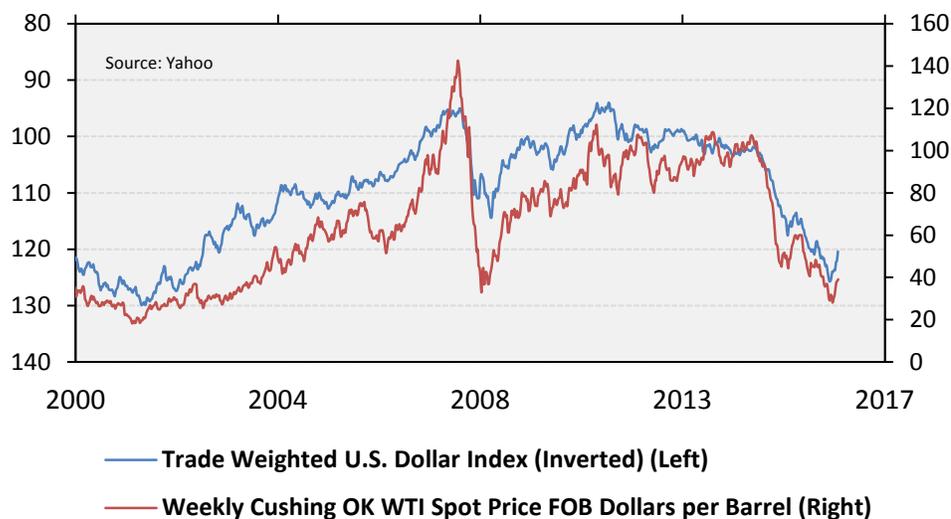
means cheap oil could persist for longer. Much of these production efficiency gains can be attributed to the concerted effort by energy companies to increase investments in oil production technology. With the U.S. leading the pack and nearly tripling its capex from 2009 to 2014, global capex grew by 50% reaching a peak of over \$500 billion.

However, capex has now decreased dramatically since its peak, and spending cuts will continue as companies review long term investment strategies in light of recent events. Moreover, the fortitude of shale companies is beginning to crack at these lower prices. According to Deloitte, a third of U.S. producers may face bankruptcy as banks tighten credit lines. During the shale revolution from 2012 to 2015 the amount of debt accrued by oil and gas companies ballooned to over half a trillion dollars. It was easy to obtain a loan than when oil was \$100/bbl. However, banks heavily exposed to the energy sector are beginning to rein in borrowing facilities by as much as 30% at these low oil prices. Already over 50 North American oil and gas companies have filed for bankruptcy year-to-date. As the biannual borrowing base redetermination period commences, many more could follow. The current restructuring of the oil industry has created a Darwinian struggle and over the long term will negatively impact the industry growth needed to keep pace with global demand.

Other unexpected economic changes, political events, and market psychology have contributed to both stability and volatility in oil prices. Abrupt supply changes, such as the March 29th recent pipeline explosion in Nigeria and political stalemates between Iraq and Kurdistan, provide short term price volatility. The recently announced “freeze” agreement amongst some major OPEC members and Russia could have marked a turning point, however, as the April 17th OPEC meeting approaches, the market remains skeptical that a freeze will offset the current supply surplus. The fact that the freeze would occur at record production levels, that it excludes Iran and Libya, and that compliance is optional does not suggest crude supply/demand balance will be restored. However, it will provide a floor to oil prices. If anything, crude oil price volatility could intensify leading up to the OPEC meeting. Indeed, the latest comments from deputy crown prince Mohammad bin Salman that there will only be a freeze if Iran and other producers participate whacked the market on April 1st. It is also relevant that Saudi Arabia is considering a 5% sale of its oil behemoth Aramco. This could have significant implications on Saudi incentives for future oil prices. Nonetheless, we think some kind of bullish news could come out of that meeting.



Oil Price Should Rally As USD Weakens



The U.S. dollar has also played a major role in influencing oil prices. A strong dollar has made oil more expensive for countries with different currencies and pushed prices down further in the U.S. At MRP, we expect the dollar to [continue to weaken](#) when U.S. inflation surges as energy prices rise and the Fed raises rates in only a gradual manner. Inflation-adjusted interest rates could become very negative.

Globally, the IEA suggests supply will remain robust but exploration and production spending will decrease, dragging down supply growth rates. According to Rystad Energy, world E&P investments will decrease by 20%. To put this into perspective, Tudor, Pickering, Holt & Co. noted 150 delayed projects that represent 13 million bbl/day or the equivalent of 15% of aggregate global production. Rystad also notes that even prior to the recent oil slump, energy companies had cut their workforce by 16% with reductions expected to continue into 2016. HR specialist, Hays PLC, reported that 72% of global laid-off energy workers are looking for jobs in other industries. Re-hiring of laid off workers as dormant wells come back online will be particularly problematic for U.S. producers in an economic environment where the unemployment rate is now 5%. It should be remembered that when U.S. production began gaining momentum the unemployment rate was close to 10%. The process of finding, hiring, and training workers to safely perform technically complex work is a major roadblock on the path to rapid production normalcy.

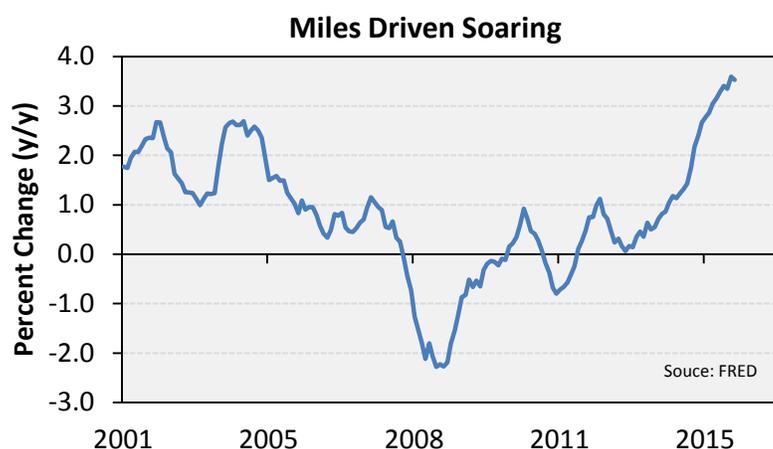
Adding to the difficulty is the amount of time it would take to restart normal operations. An expert from Oliver Wyman supposes that it would take six months, whereas the CEO of Hess Corp. says it might take up a year. MRP believes that it will take a lot longer to bring wells back online. The ramping up of so-called “nimble” shale producers has become increasingly uncertain as idle machinery, a diminished workforce, and tightening credit lines inhibit a quick return to production even as oil prices head higher. Bill Thomas, chief executive of EOG Resources, an oil and gas exploration company, remarked, “It’s not really like just turning on the light switch.”

We believe that the drastic reduction in E&P spending, widespread job cuts, large-scale capping of oil wells, idle wells, decreasing yields from old wells, plus fewer drilling of new wells will shrink oil service capacity so much that future demand growth will not have adequate support. The ensuing supply shortage could force oil prices as high as double what they are today.

Moving forward, we have observed that the cyclical nature of oil boom and busts typically leads to sharp corrections, whereby unusual fluctuations in supply/demand due to transient events eventually subside and the oil balance falls back in line with equilibrium. This is true in virtually all industries. The current oil industry bust is already shifting the pieces needed for the next boom, *which we believe may be on the horizon.*

DEMAND

The biggest focus on the demand side of the oil industry is on the emerging markets, particularly China and India, which dominate the EM crude oil demand picture. The IEA in their Medium-Term Oil Market Report (MTOMR) forecasts demand to grow in China at an annual average rate of 1.2% from 2015-2021, which is 0.5% below the previous IEA forecast period. The lower forecast is in large part due to China's continued shift from a heavy oil-intensive industrial exporting economy to a more consumer-focused economy. This implies a deceleration in crude oil demand growth over the next six years, which will be more pronounced for gasoil and diesel. Meanwhile consumer-based petroleum products, namely gasoline, will see sharp growth as the Chinese consumer's appetite for modern vehicles grows. Demand growth will be curtailed as vehicle efficiencies improve. For India, the IEA forecasts demand to grow at an average annual rate of 4.2%. As with China, much of the growth will occur as India's vehicle fleet expands and pushes demand for gasoline and diesel higher. Crude demand will also be augmented by expanding airline travel routes and tourism in developing countries. Overall, non-U.S. demand is expected to continue to grow, albeit at a somewhat slower rate.



What is the market missing? The U.S. consumes about 20% of world oil, 47% of which is gasoline consumption. Oil demand is expected to decline in the medium term by 0.1mb/d according to the IEA which cites vehicle efficiency gains as the major constraint on oil demand. MRP believes they will be revising that view substantially: the recent drop in gasoline prices has triggered higher SUV sales which will act to counter efficiency gains. One only has to look at total

vehicle miles driven since peak oil prices to see the dramatic effect of oil price elasticity. Heading into this year's peak travel season with oil prices at decade lows, gasoline demand is expected to reach record levels in 2016. Our calculation of average percent increase in gasoline demand from March to August suggest a nearly 6%(±2) increase. In fact, gasoline demand was already at record levels in March. Robust consumer demand for gasoline and jet fuel stemming from vehicle and airline travel could provide additional stability to oil prices as record consumption forces inventory levels down.

Unusual warm weather has contributed to the stunning rise in inventories and therefore in recent winter months placed further downward pressure on oil prices. Energy demand has been muted with winter temperatures far above average. The National Oceans and Atmospheric Administration (NOAA) reported in their global temperature analysis that the six highest monthly temperature departures on the 137-year record have all occurred in the past six months. Though the unpredictable nature of weather does not lend itself to long term forecasts, it is likely that a strong El Niño will bring above average summer temperatures and increased cooling needs, having the opposite effect by further bolstering crude demand.

THE BOTTOM LINE

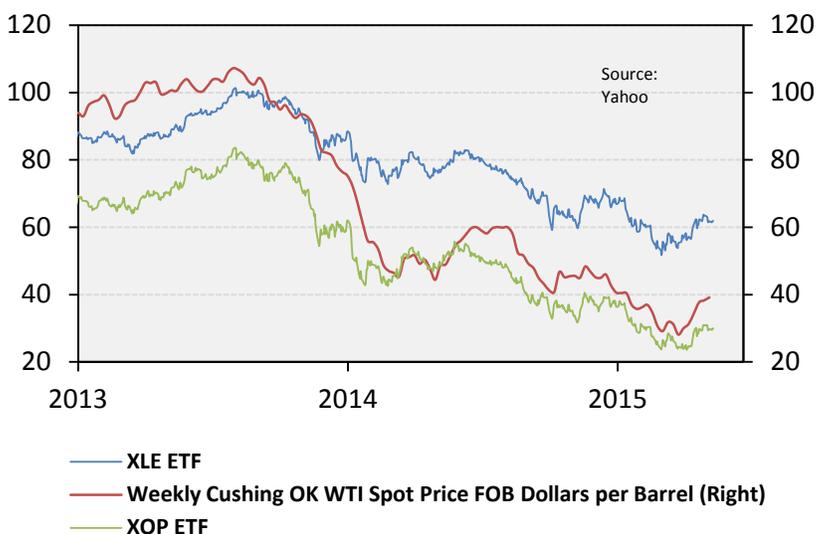
In the very long term, MRP believes oil will become obsolete – after all oil is a finite resource. The eventual demise of oil, much like the whale oil industry, will come from lack of resources while alternative energy

sources and new technologies fill the void. The Schumpeterian disruption is already underway in the transportation and utilities industry and is picking up speed, which will be an added boost to MRP's [Clean Energy theme](#) in which we are long the solar and wind sectors. China, for example, has become a global leader in the development and use of solar power. The country now has solar energy capacity of 42.3 gigawatts or nearly 4% of their overall energy capacity, and that number is expected to triple by 2020. This is only one example of the slow alternative energy transformation. Despite these latent tectonic shifts and barring any major global economic obstacles, oil demand in the short-to-intermediate term in emerging economies will trend upward with demand primarily coming from heavy manufacturing industries and vehicle fleet expansion.

Nonetheless, we believe oil prices will reverse quickly over the short-to-intermediate term in response to a new supply/demand unbalance that is about to unfold. The overall contraction of the energy industry witnessed in recent months – that includes deferred E&P projects, furloughed workers, drastic crude production cuts, and faltering loans – will curb supply growth significantly in the medium term. Meanwhile, we foresee an uptick in demand over the same period. Together, these set up a scenario for a temporary crude oil shortage and sharply higher prices. MRP sees oil prices moving to a \$60-80/bbl range. At this point, the daily narrative in the media will shift from talk of a glut to complaints of shortages.

Indeed, if crude oil winds up being in short supply and prices rise accordingly, it will profoundly influence the global markets. On the big picture level, a rapid rebound in prices will push up headline inflation readings sharply higher. If oil prices only go sideways from here at, say, \$40/barrel, the y/y change would still not be positive until December. But if prices rise more quickly to the \$60-80/bbl range, the overall inflation number would be pretty shocking by the third quarter. As MRP has previously [shown](#), core level inflation is already rising strongly, but it has been more than offset by the weakness in energy and other goods. This has been particularly true for prices at the “core” services level which are up 3.1% y/y. Thus, a more vigorous than expected oil price rebound could mean disturbingly high inflation numbers by late summer. Monetary policy changes would unfold very differently than the market has now priced in with multiple rate hikes getting put back in the table.

Crude Prices Driving Oil Company Shares



Obviously, the entire energy sector would be a beneficiary. As oil prices have fallen, oil company share prices have plunged as well -- down 35% since June, 2014 and almost 50% peak-to-trough. More directly affected sectors like Oil & Gas Producers have plunged 70%. To be sure, a recovery in product prices could lead to some whopping gains in energy company stock prices. Indeed, we expect that energy could be a top performing sector in the next few years. We are already long the XLE as a hedge in our [Short U.S. Refiners theme](#). **MRP is adding the Energy sector at this point as an active theme.**

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