

2016 Outlook for Energy

The Guinness Atkinson Global Energy Team, January 2016

2015 was a very difficult year for energy markets. We'd like to share with you some big picture thoughts on the key 2015 events and our outlook for 2016 and beyond.

Highlights

2015 IN REVIEW

- **After the historic decision by OPEC* in November 2014 to switch from a price to a market share strategy, the oil price fell sharply and remained at a depressed level for much of 2015, averaging \$54/barrel(bl) for the year.** North American oil production moved into decline, while global oil demand grew handsomely. However, the market was kept over-supplied for much of the year as a result of extra supply from OPEC. We view this move, particularly in Saudi's case, as an attempt to keep the boot on the throat of non-OPEC producers, and ensure a lasting re-set of the oil cycle.
- **The dominant themes for global oil markets last year were:**
 - OPEC holding firm on market share strategy; production raised by 1.3 million(m) b/day**

The oil market was kept over-supplied for much of the year as a result of 1.3m b/day of extra supply from OPEC, most notably from Saudi Arabia and Iraq.
 - Continued but slowing non-OPEC supply growth, with US production moving into decline**

Non-OPEC supply grew by around 1.3m barrels per day, reflecting growth from the US in the first half of the year (though now in decline), and the start-up of new projects elsewhere that were sanctioned well before the fall in oil prices.
 - Surging global oil demand, expected to have grown by around 1.8m b/day**

This is made up of non-OECD oil demand growth of 1.3m b/day and OECD oil demand growth of around 0.5m b/day. This represents the strongest year of demand growth since the post-financial crisis bounce in 2010. In the US, vehicle miles travelled are on the rise again, while market share for vehicle sales in the US and China shifted in favor of SUVs over smaller cars.
- **For natural gas in the US, 2015 ended up being a continuation of the same theme as in the past several years, with the market generally in oversupply.** Production growth from newer low-cost gas shales (the Marcellus in particular) along with by-product gas from new shale oil production regularly outran demand growth. Henry Hub averaged \$2.63/million cubic feet (mcf) in 2015, versus \$4.26 in 2014.

It was a second poor year for energy equities, which fell in sympathy with the oil price. The MSCI World Energy Index started the year positively, matching the gains made by the MSCI World in the first four months of 2015, coinciding with the oil price rising into the mid \$60s/bl. Energy equities then traded weakly for most of the rest of the year, ending 2015 with a total return of -22.2% versus the MSCI World's -0.3%. Similar to 2014, the performance of the MSCI World Energy Index was only part of the story, with a number of energy equity subsectors down by around 30% to 60%, particularly those more levered to oil.

OUTLOOK FOR 2016

- **We expect the oil price to remain volatile for a number of months**, with the market still oversupplied. A recovery to \$70+/bl is likely when the market rebalances.
- **There are a number of positive signs that the market is rebalancing:** oil demand grew strongly in 2015 and is expected to do so again in 2016; US oil production (the principle cause of the oversupply) peaked in April 2015 and its decline is accelerating; the rest of non-OPEC supply has stagnated and we see significantly reduced new project supply from 2017 onwards. An oil price below \$70/bl is not high enough to justify new investment in higher cost and more marginal non-OPEC projects. Against that, we may well see OPEC supply grow again in 2016 as Iranian production recovers post the lifting of sanctions, and if the political situation in Libya improves. Neither of these events would derail the rebalancing process, only delay it by a matter of months.
- **In the meantime, Saudi are suffering a significant fiscal deficit (c.\$100bn in 2015) but continue to act rationally in their response to a depressed oil price**, realising that an ‘emergency’ production cut would be a fools’ errand as they would simply encourage a sharp recovery in non-OPEC growth. That said, an extremely low price (sub \$40/bl) may well encourage them to stabilize the market, but not necessarily in a vocal fashion. Longer term, we believe that Saudi seek a ‘good’ oil price, well in excess of current levels to balance their fiscal needs, but they realize that patience is required to achieve that goal.
- If we pull together our supply and demand expectations for 2016, our ‘base’ case is that OECD oil and oil product inventories build during the start of 2016 (mainly as a result of Iranian oil production increases and the hangover of 2015 oversupply) before a reasonably rapid decline towards more normal levels in the last few months of the year. If the non-OPEC supply data is supportive, it may allow Saudi to seek higher oil prices at the June OPEC meeting.
- **Before the market tightens, we could well see lower oil prices.** We have seen oil prices drop sharply lower at the bottom of the cycle and this could happen again. Historically, oil prices have bottomed in tandem with a combination of events such as OPEC action, oil inventories becoming full, existing non-OPEC supply shut-ins and oil price forward curves moving into steep contango. The volatility and shape of the forward curve indicate that we are close to this today.
- **Energy equities have now underperformed the broad market for longer than they did after any of the large price declines since 1970**, as represented by the MSCI World and MSCI World Energy Indices. The weighting of energy in the S&P 500 at the end of 2015 was 6.4%, close to its historic lows. This also leaves the relative price-to-book ratio of energy vs the S&P500 at a 50 year low. We do not expect these extremes to be sustained.
- **The valuation sensitivity work that we regularly perform tells us that energy equities are today discounting an oil price (into perpetuity) of around \$50-55/barrel.** This is above the current spot oil price and in line with the four year forward prices for both Brent and WTI.
- **In the shorter-term, stock selection remains paramount** as we traverse the tightrope of low oil prices and, in many cases, geared balance sheets. However, if you believe (as we do) that a recovery in the oil price to \$70+/bl is likely, the case for accumulating energy equities at this level looks good.

Review of 2015

After the historic decision by OPEC in November 2014 to switch from a price to a market share strategy, the **oil price** fell sharply and remained at a depressed level for much of 2015. Brent oil traded in a range from \$35–68/bl, closing 2015 near the bottom of this range, and averaging \$53.6/bl for the year.

North American unconventional oil production (the growth of which was the key to unbalancing the market in 2014) moved into decline, while global oil demand grew handsomely. However, the market was kept oversupplied for much of the year as a result of 1.3m b/day of extra supply from OPEC, most notably from Saudi Arabia and Iraq. We view this move, particularly in Saudi's case, as an attempt to keep the boot on the throat of non-OPEC producers, and ensure a lasting re-set of the oil cycle. Global oil and oil product inventories grew sharply as a result and ended the year at record levels.

The major components to oil supply/demand for 2015 were as follows:

- **OPEC oil supply (including NGLs)** is likely to have grown by around 1.3m b/day (totalling 38.0m b/day, versus 36.7m b/day in 2014). Saudi and Iraqi production were both higher by around 0.6m b/day, supported by modest rises from Kuwait and UAE (with all four countries achieving record production levels). Libyan production remained depressed at around 0.4m b/day, similar to 2014. OPEC met in December 2015 and gave no indication that they would shift from their current strategy;
- **Non-OPEC oil supply** is likely to have grown by around 1.3 million barrels per day in 2015 (58.3m b/day, versus 57.0m b/day in 2014), principally 0.8m b/day from the US (driven by shale oil which, although now declining, still averaged higher in 2015 than 2014) and small increases from Brazil, Russia, UK North Sea and China. Aside from US shale oil, growth in the rest of non-OPEC largely reflects the start-up of new projects (sanctioned well before the fall in oil prices) as well as the immediate benefit of lower local currency production costs as a result of the stronger US Dollar;
- **Global oil demand** is likely to have grown by around 1.8 million barrels per day in 2015, according to the IEA. This is made up of **non-OECD oil demand** growth of 1.3m b/day (with China up 0.7m b/day) and **OECD oil demand** growth of around 0.5m b/day (with US and Europe both up 0.3m b/day). This represents the strongest year of demand growth since the post-financial crisis bounce in 2010, and shows the stimulus of low gasoline prices. In the US, vehicle miles travelled are on the rise again, while market share for vehicle sales in the US and China shifted decisively in favor of SUVs over smaller cars;
- **OECD oil inventories** at the end of November 2015 were estimated to be at a record high of 2,969 million barrels, 11% above the 10 year average and well above the 2,705 million barrels level reported at the end of November 2014. The rise in inventories over the last 12 months implies that the market has been, on average, around 0.7m b/day oversupplied.

For **natural gas**, 2015 ended up being a continuation of the same theme as in the past several years, with the market generally in oversupply. Production growth from newer low-cost gas shales (the Marcellus in particular) along with by-product gas from new shale oil production (i.e. associated gas) regularly outran demand growth until the price dipped and coal-to-gas switching kicked in. With shale oil supply moving into decline in April and gas prices moving lower, the rate of supply growth slowed as the year went on. Henry Hub averaged \$2.63/mcf in 2015, versus \$4.26 in 2014. The year ended on a particularly weak note, with Henry Hub dipping below \$2/mcf as an extremely mild Autumn/early winter depressed heating demand for gas. Natural gas inventories ended the year at the top end of the 10 year range.

Outside the US, natural gas prices also declined, the biggest influence being the weakening of the oil price. European natural gas averaged \$6.50/mcf (vs \$8/mcf in 2014) and Asian natural gas (as measured by the ICAP JKM North-East Asian LNG contract) averaged \$9.3/mcf (vs \$14.4 in 2014).

It was a second poor year for **energy equities**. The MSCI World Energy Index started the year positively, matching the gains made by the MSCI World in the first four months of 2015, coinciding with the oil price rising from the mid \$50s/bl to mid \$60s/bl. Energy equities then traded weakly for most of the rest of the year, ending 2015 with a total return of -22.1% versus the MSCI World -0.3%.

And similar to 2014, the performance of the MSCI World Energy Index was only part of the story, with a number of energy equity subsectors finishing the year down by around 30% to 60%, particularly those more levered to oil.

A quick tour of some of the main energy sub-sectors paints a picture for the energy equity sector's performance as a whole in 2015:

- **Oil refining.** The best performing sub-sector, with strong returns from European, US and international oil refiners. The low oil price generated a strong oil demand response, which in turn boosted crack spreads (refining margins) in most regions. European refiners saw the best gains, having started 2015 with their earnings more depressed than their US counterparts.
- **Integrated oil and gas companies.** The integrated model has provided the defensive benefits of improved downstream (refining) margins to offset declines in upstream earnings. By way of illustration, 71% of Exxon's net income was derived from their downstream and chemicals division in the third quarter of 2015, compared to 26% in the same quarter of 2014. As a group, the integrated companies also benefitted in the downturn from lower gearing than most other energy sub-sectors.
- **Exploration and production.** Almost all E&P sub-sectors suffered, in particular those exposed to North American operations. With both oil and gas prices weak, there was no hiding place for the producers of both commodities, though in general producers in the faster growing shale oil basins (Permian and STACK) fared better. Globally, the biggest equity falls were suffered by E&Ps with weak balance sheets, with a number of geared E&Ps falling 50%+ as liquidity concerns grew and oil price hedges rolled off.
- **Energy services.** A mixed bag, with the largest, best-diversified energy service companies faring relatively well (a function of their ability to outperform smaller peers operationally in the downturn and take market share, coupled with stronger balance sheets); while over geared onshore (e.g. most pressure pumpers) and offshore service companies (e.g. offshore drillers, seismic) were poorly placed to weather the significant cuts in capital expenditure seen across the sector.
- **Coal.** Generally the worst performing sub-sector, with coal prices weak. Thermal coal continued to lose market share to cheap emerging sources of natural gas, while metallurgical coal demand remained subdued thanks to the slowdown in construction activity in China. The market capitalisation of the US coal sector has been reduced by over 90% since 2010.
- **Renewables.** Variable performance across the renewable energy sub-sector. Solar companies were particularly mixed, with most solar manufacturers posting positive returns, while the solar development companies (or 'yield cos') performed poorly as interest rate rises and poor capital structures weighed.

The **Guinness Atkinson Global Energy Fund** in 2015 produced a total return of -27.97%. This compares to the total return of the MSCI World Energy Index of -21.86%. The underperformance of the Fund versus the Index can largely be explained by the Index's significant weighting in the largest five oil and gas majors (Exxon, Chevron, Total, Shell and BP, which comprise around 40% of the Index), all of which provided some defensive qualities in the face of the declining oil price. As figure 1 illustrates, the integrated sub-sector outperformed most other energy sub-sectors, the average integrated company declining by 9%. Within the Fund, the best performing investments were spread across refining (OMV in Europe and Valero in the US), renewables (JA Solar and Trina Solar), plus one oil service position (John Wood Group) and one US oily E&P position (Newfield). The weakest investments were services and E&P focused, with Soco, Southwestern and Devon (E&Ps) and Helix and Unit (services) among those particularly adversely affected by the low oil and gas price environment.

Performance

As of 12/31/15	YTD	1 Year	5 Years*	10 Years*	Since Inception (June 30, 2004)*
Global Energy Fund	-26.97%	-26.97%	-8.06%	-.30%	5.93%
MSCI World Energy Index	-21.86%	-21.86%	-3.06%	1.71%	5.23%
S&P 500	1.41%	1.41%	12.53%	7.29%	7.39%

Gross expense ratio: 1.30%

*Periods over 1 year are annualized returns

Performance data quoted represents past performance; past performance does not guarantee future results. The investment return and principal value of an investment will fluctuate so that an investor's shares, when redeemed, may be worth more or less than their original cost. Current performance of the fund may be lower or higher than the performance quoted. Performance data current to the most recent month end may be obtained by calling 800-915-6566 and/or visiting www.gafunds.com

The outlook for 2016

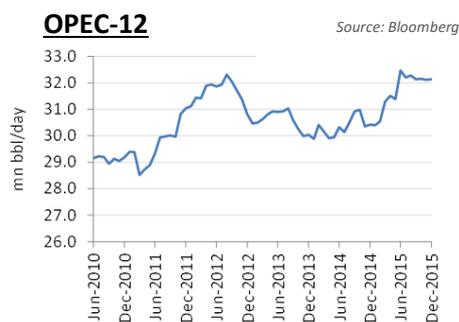
Oil supply

The outlook for growth in world oil supply for 2016 and beyond is deteriorating as a result of low oil prices. OPEC's low oil price strategy has forced 50% capex cuts among US producers between 2014 and 2016, forcing US onshore oil production into decline for at least the first half of 2016. Meanwhile, non-OPEC (ex-US) is suffering an activity cut which is unprecedented in recent years and that will lead to stagnating supply in 2016 and significantly reduced new project supply from 2017 onwards. That said, as the OPEC market share battle continues, we see risk of supply increases in particular from Iran and Libya, less so from Saudi and Iraq. The non-OPEC supply reaction that Saudi sought is happening; the question is 'When does Saudi (and therefore OPEC) claim victory and allow prices to start rising again?'

OPEC

OPEC is entering 2016 with little adherence to its group-wide quota. The market share strategy was instigated by Saudi Arabia (the country that is best equipped to deal with the low oil prices that it has caused) and they continue to act rationally in their response to a depressed oil price, realising that an 'emergency' production cut would be a fools' errand as they would simply encourage a sharp recovery in non-OPEC growth. It makes more sense for them to continue to tolerate a lower oil price for now, resulting in diminished prospects for oil production outside OPEC when the price starts to rise again. Longer term, we believe that Saudi seek a 'good' oil price, well in excess of current levels to balance their fiscal needs, but they realize that patience is required to achieve that goal.

The question now is: "for how long does Saudi persist with this strategy?" It is a very expensive strategy in the near term (Saudi is forecasting an \$87bn deficit in 2016 even after cutting spending by \$36bn), but



it is one that is clearly achieving its stated objective. There is a reasonable chance that Saudi, potentially with Kuwait and the UAE, start to quietly hold back some production later in the year at about the time that global oil inventories start to peak (see page 11). We do not expect to see an oil price low enough in the near term to force any dramatic and public moves from Saudi before that time, partly because Saudi is willing to tolerate the pain as long as some of its neighbours (most notably Iran) are suffering even more pain.

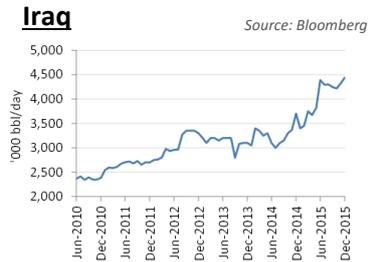
We must not forget the 'wild card' risk of significant **political instability**, this time rearing its head among the core GCC states. The recent beheading of Shia cleric Nimr al-Nimr by Saudi has led to a rekindling of the Shia-Sunni conflict in the region and diplomatic expulsions have resulted, with Bahrain, UAE and Sudan joining Saudi in diplomatic action against Iran. Almost all of Saudi's oil output passes through the Shia heartland of the country, and it is not inconceivable that this supply could be disrupted through terrorist activity (despite Saudi's concerted efforts to maintain security around its oil infrastructure), given the heightened state of relations between Sunni and Shia in the country.

Saudi oil production reached a record of 10.5m b/day in June 2015, according to the IEA, and the drilling rig count remains elevated (at 67 rigs drilling for oil and 60 for gas, versus 81 for oil and 45 for gas in April 2015). The higher level of gas drilling activity will allow Saudi to replace around 0.5m b/day of oil that is currently being consumed for electricity generation with new gas production, we assume over the next two or three years or so. Beyond that, Saudi has a natural annual decline rate of around 0.5m b/day; the Kingdom needs to keep drilling new wells to

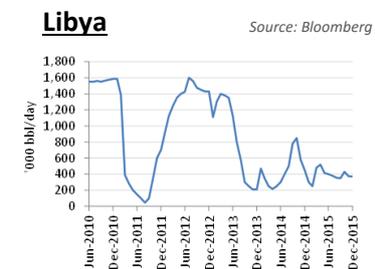


maintain current production capacity. Nobody can say what spare capacity is. If we had to estimate, we would say less than 1m b/day (less than 1% of world capacity) – very different to the 7m b/day (12% of world capacity) that it held in 1986; we are tempted to believe that Saudi is producing close to its operational maximum levels. This is pretty similar for Kuwait and the UAE as well, in our opinion.

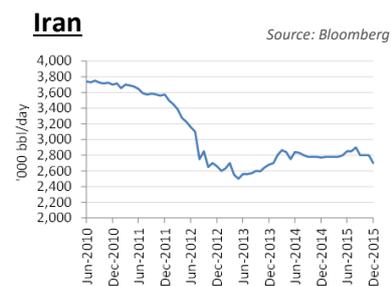
Iraqi oil production increases in 2015 appear to have come from infrastructure-related improvements and increased efficiencies. We note that the National Oil Company advised oil and gas contractors in September 2015 to limit investment levels in 2016 as it feared that it would not be able to pay its commitments. Lower oil prices are clearly impacting activity levels in the country; BP cut its 2015 budget for Iraq operations by \$1 billion to \$2.5 billion in January 2015. Maybe we could see a further 0.25m b/day from Iraq in 2016, but not a repeat of last year.



Libyan oil production has been significantly affected by the civil war, averaging only 0.4m b/day in 2015 versus 1.4m b/day in 2012. At least two political bodies claimed to be the government of Libya through 2015, although a UN-sponsored agreement to form a unified interim government was signed on 17 December 2015 and gives indication that the deadlock between the eastern and western factions is being resolved. Nonetheless, ISIS is now present in the country and its presence will hinder a recovery in oil exports in 2016. The production disruption stems from oil export ports being blockaded (the larger export facility Es Sider has been under force majeure for most of 2015) as well as production facilities being damaged and/or blockaded. The full extent of the damage is not clear, but we would assume that around 0.5m b/day could come back relatively quickly but that any increases beyond that will require substantial infrastructure investment.



Iranian oil production increases have been on the agenda for some months now, although the process of approval and sanction lifting has been slower than many expected. The US administration now expects to start lifting sanctions as early as January 2016 after the International Atomic Energy Agency found no



credible evidence that Tehran has recently engaged in atomic weapons activity. A few further steps will require approval after this, and then Iran will be free to increase its oil exports. We expect an increase of around 500k b/day and for this to take effect at the end of the first quarter of 2016. We think 500k b/day is a reasonably sustainable increase in production levels but note that production rates could appear higher for the first couple of months as oil is exported from floating storage. Iran has a target of

ultimately producing 5m b/day; while it has the resources to do so, it would need a new hydrocarbon fiscal regime and maybe \$50bn of investment from international oil companies – unlikely in the near term in our opinion.

US onshore

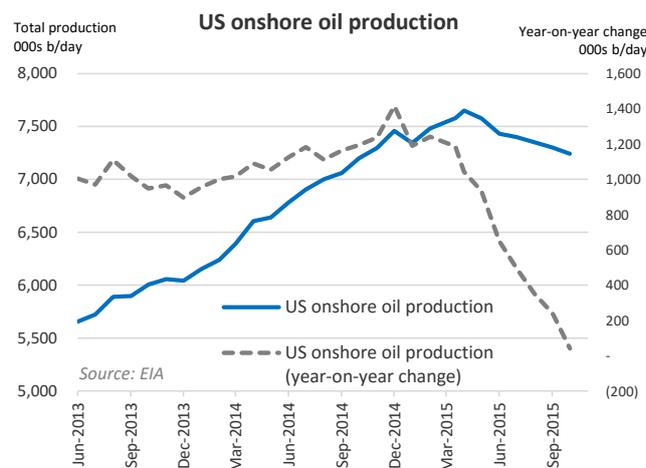
We expect US onshore oil production to suffer as a result of low oil prices throughout the entirety of 2016. The **Baker Hughes oil-directed rig count** is at 536 at the time of writing (down from 1,609 in October 2014), while the combined oil and gas rig count is at 698 (down from 1,930 in October 2014); both are in declining trends. WTI at \$30-50/bl oil is just not sufficient for the US oil industry to survive; that's why capex was down over 40% in 2015 and is likely to decline by a further 20% or more in 2016. Lower oil rig count levels will lead to lower oil production levels and (based on the interplay between oil prices, rig counts and production levels in 2015) there is likely to be a six month lag between oil prices

rising and oil production doing the same. The effects of cost deflation, hi-grading of drilling locations and efficiency gains make the relationship between rig count and oil production even more complex but we do not see this as a re-run of the gas markets in 2008/2009. The US onshore oil market has no Marcellus/Utica equivalent and little 'associated' oil being produced as a by-product of gas.

Rig count (key US shale plays)	12mth peak	12mth trough	Peak v trough
Marcellus	87	44	-49%
Utica	46	19	-59%
Haynesville	52	28	-46%
Niobrara	107	35	-67%
Permian	565	227	-60%
Bakken	189	62	-67%
Eagle Ford	264	83	-69%
Sum of key shale plays	1305	504	-61%
<i>Baker Hughes US rig count</i>	1917	700	-63%

Source: Baker Hughes

US onshore oil production, having grown at 1-1.5m b/day per year between 2010 and 2014, is likely to register a production decline of around 0.3m b/day in 2016. US onshore production has declined by 0.4m b/day over the last six months, an annual decline rate of 0.8m b/day – a dramatic change in twelve months.



We do not expect the North American oil industry to deliver significant new **efficiency gains** that would allow it to satisfy world oil demand growth at \$40-50/bl oil. As far as we can see, most of the efficiency gains delivered by the shale industry have come from the drilling of longer wells rather than the improved recovery of oil per unit of reservoir. Well lengths appear to be reaching optimum levels (there are diminishing returns as well lengths get longer and drill bit 'trip times' expand), so we may well be reaching the end of the road for efficiency gains. The Permian

appears to offer the greatest potential to deliver new production growth, but we do not expect the region will be anything like as transformational as the Marcellus was to the US gas market.

\$50 oil in 2016 will also feel worse than \$50 oil in 2015 because the industry has much poorer **oil price hedging** for 2016. Taking a group of 34 US E&P companies as an example, the group had 33% of their 2015 production hedged at nearly \$80/bl, which falls to only 18% of production hedged at \$66/bl. We hear very little of any companies hedging 2016 at the current strip; the \$40.2 WTI oil strip price for 2016 is just not enough.

Non-OPEC (excluding US onshore)

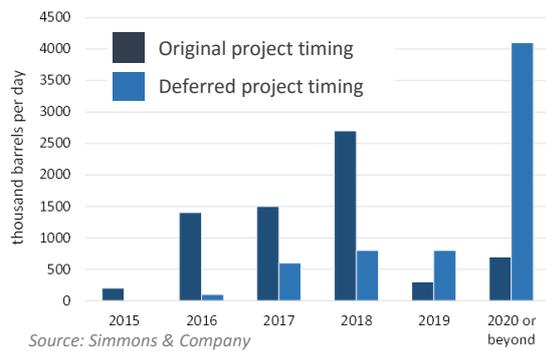
Having been robust in 2015, **oil production from non-OPEC (ex-US)** is likely to decline a little in 2016 and more in 2017 as a result of the backlog of new projects falling away. There is a substantial fall in production coming as a result of sharply reduced investment levels.

Non-OPEC ex US supply is likely to be down 0.2m b/day in 2016 versus 2015, and that rate of decline will increase in 2017 to around 0.5m b/day. After this, we see reasonable chance that non-OPEC (ex US) oil production will decline more sharply and note that if oil prices remain low in 2016, **the slate of new projects starting in 2018/2019 will be very poor indeed**. Brazil and Russia contribute the major part of the potential new supply.

After falling 25% in 2015, we expect capex for the region will be down a further 15% or more in 2016 (based on \$60 Brent in 2016). Without a recovery in oil prices, we expect the same trend again in 2017, yielding a compound **decline in capex of around 50%** from its peak. This is substantially bigger than the capex decline of 25% witnessed between 2008 and 2009. Tumbling rig rates and seismic rates plus general cost deflation means that planned expenditure will go further, but even allowing for this there is a substantial shortfall in 'new project' production coming from 2017 and beyond.

Simmons & Company track 5.4m b/day of new oil projects that have been cancelled due to lower oil prices since the OPEC meeting in November 2014, and we note that very few new project sanctions are expected to come in 2016. Exploration success has been very disappointing over the last three or four

Delay in production of new non-OPEC projects



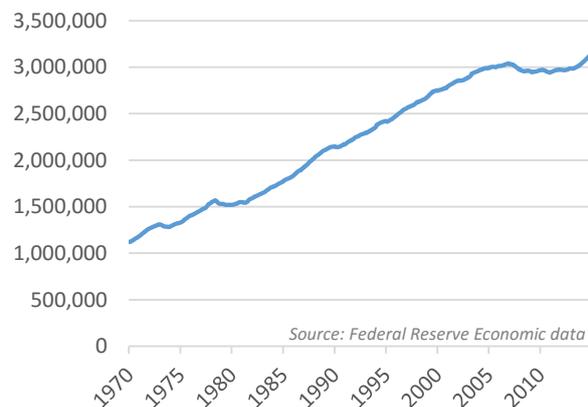
years and the activity level for 2016 looks very low gain. Without improved exploration activity or higher oil prices, the non-OPEC ex-US production shortfall will only worsen. The oil is still there, there's just not enough cash to develop it, and for the moment the companies are more worried about paying their dividends than they are about delivering longer-term production growth potential. With over 250,000 employees having lost their jobs in the industry in the last eighteen months, it also begs the question whether the industry has the manpower to deliver longer-term production growth.

Oil demand

The IEA are forecasting growth in oil demand in 2015 of around 1.8m b/day, the highest growth for five years, then 2016 demand growth of 1.2m b/day. The 2016 forecast ties in with the current IMF forecast for global GDP growth of 3.6%.

What can we see 'on the ground' in terms of oil demand? For the transportation sector, 2015 was a year of resurgent SUV sales and increasing miles travelled, across the globe. This effect was particularly pronounced in the US, with SUV sales growing by 15% year-on-year and vehicle miles travelled rising at the fastest rate since 1995 (reaching a new peak in late 2015 after reversing the decline that started in 2007). The greater market share taken by SUVs and other larger light vehicles in 2015 also resulted in the overall fuel efficiency of the US vehicle fleet worsening in 2015, after several years of improvements.

US vehicle miles travelled (millions)



It was a similar picture in China, with SUV sales surging 45% year-on-year, outstripping the sales of all other types of vehicles by a comfortable margin. Interestingly, gasoline consumption growth in China (10 year CAGR of 8%) has lagged far behind growth in registered passenger vehicles (22% 10 year CAGR). Some of this can be explained by the installed base shifting from being dominated by taxis (which are continuously driven) to private vehicles, but it does nevertheless suggest pent-up demand as vehicles start to be driven more.

We expect the positive trends in vehicle sales mix and use to continue into 2016, but also see it as logical that demand growth in 2016 will be lower than 2015, since 2015 enjoyed various one-off boosts to consumption as a result of the lower price. Even so, growth in demand of 1.2m b/day in 2016 would still represent above average demand growth when compared to the previous five years.

Global demand growth in 2016 of 1.2m b/day comes entirely from non-OECD demand, with no growth at all in OECD demand.

As can be seen, the non-OECD world has settled down into a steady pattern of growth since 2012. In 2015 and 2016, the lion's share of growth comes from Asia, with the rest of non-OECD demand being dampened by the FSU's consumption going into reverse. OECD demand in 2016 is forecast to be flat, with North America and Pacific flat, and Europe down slightly.

World oil demand 2006-2016

Source: IEA

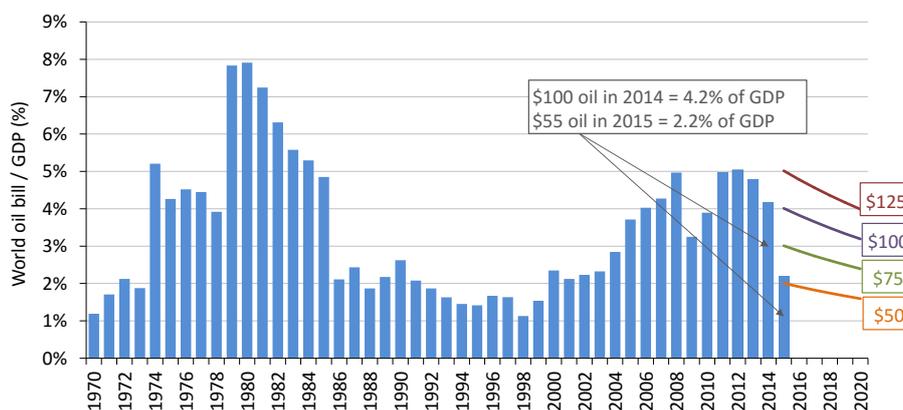
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
OECD demand											
North America	24.5	25.8	24.5	23.7	24.1	24.0	23.6	24.1	24.1	24.4	24.4
Europe	15.7	15.6	15.5	14.7	14.7	14.3	13.8	13.6	13.4	13.7	13.6
Pacific	8.7	8.7	8.3	8.0	8.2	8.2	8.5	8.4	8.2	8.1	8.1
Total OECD	48.9	50.1	48.3	46.4	47.0	46.5	45.9	46.0	45.7	46.2	46.2
<i>Change in OECD demand</i>	-1.5	1.2	-1.8	-1.9	0.6	-0.5	-0.6	0.1	-0.3	0.5	0.0
NON-OECD demand											
FSU	4.0	4.0	4.2	4.0	4.1	4.4	4.6	4.7	4.9	4.9	4.8
Europe	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
China	7.2	7.6	7.7	7.9	8.9	9.3	9.9	10.3	10.6	11.3	11.6
Other Asia	9.3	9.8	9.9	10.3	10.8	11.1	11.4	11.8	12.0	12.5	13.0
Latin America	5.2	5.3	5.6	5.7	6.1	6.2	6.5	6.7	6.8	6.8	6.8
Middle East	6.1	6.4	6.7	7.1	7.3	7.5	7.9	7.9	8.0	8.2	8.3
Africa	2.9	3.3	3.3	3.4	3.5	3.5	3.8	3.9	4.0	4.1	4.2
Total Non-OECD	35.4	37.1	38.1	39.1	41.4	42.7	44.8	45.9	47.1	48.4	49.6
<i>Change in non-OECD demand</i>	1.3	1.7	1.0	1.0	2.3	1.3	2.1	1.1	1.2	1.3	1.2
Total Demand	85.1	87.2	86.4	85.5	88.4	89.2	90.7	91.9	92.8	94.6	95.8
<i>Change in demand</i>	1.3	2.1	-0.8	-0.9	2.9	0.8	1.5	1.2	0.9	1.8	1.2

Similar to 2015, there are a number of headwinds which put a cap on demand growth, particularly affecting the non-OECD region. The continued strength of the US dollar in 2015 against almost all emerging market currencies means consumers in those countries aren't enjoying the full commodity price decline, and the removal of refined product subsidies (e.g. as seen recently in India and Indonesia) also limit the decline in prices at the pumps.

That said, the IEA consistently revised demand expectations higher in 2015, and we think that they may also be being somewhat conservative in their outlook for 2016, as long as current GDP forecasts hold up.

We keep a close eye on developments in the 'new energy' vehicle fleet (electric vehicles; hybrids etc), but see nothing that makes a significant dent on the consumption of gasoline and diesel in the next few years. Sales of electric vehicles (pure electric and plug-in hybrid electrics) globally were around 0.4m in 2015, up from 0.3m in 2014. Sales of 0.4m electric vehicles represents around 0.4% of total light vehicle sales, and increases EVs share of the world car fleet to 0.1%. We expect to see EV sales accelerate in 2016 to around 0.6m, or 0.6% of total global sales. Even applying an aggressive growth rate to EV sales, we see EVs comprising less than 1% of the global car fleet in 2020.

How does the burden of oil spending compare to history? With the oil price averaging just over \$50/bl last year, it implies that the world spent around 2% of GDP on oil in 2015. This is considerably lower than the average world 'oil bill' from 1970 to 2015 of 3.4% and puts the spend on oil back into the cheap 1986-2003 range (averaging 1.9% GDP) which stimulated a significant wave of new demand. If oil returned to the 45 year average level of 3% of GDP, this implies a recovery in price to \$75/bl, inflating to around \$90/bl by 2020 as inflation and improved efficiency in the use of oil take effect.



Source: IEA, Bloomberg, Guinness Atkinson Asset Management

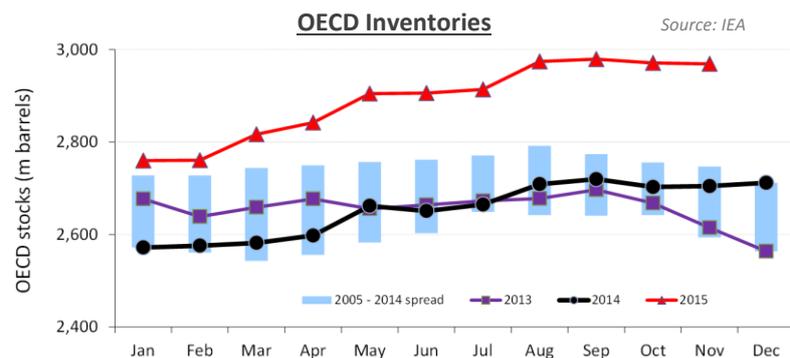
Oil inventories and conclusions

The key question that all of this analysis is directed towards is ‘when does the global oil market start to tighten?’, which we define as global demand exceeding global supply.

If we pull together our supply and demand expectations for 2016, we see a wide potential range of outcomes. The most helpful presentation of the oil demand/supply balance, we concluded, is to give three scenarios, a ‘base’ or ‘mid’ case, a ‘lower for longer’ case and a ‘rapid recovery’ case. We regard all of these as plausible outcomes, though note that the oil system is a dynamic one: if, for example, oil were to remain depressed in the ‘lower for longer’ scenario, catalysed by higher OPEC supply, it significantly increases the chance of an emergency OPEC meeting to reverse the tide.

Item (m b/day)	2015 actual (source: IEA)	2016 scenarios			Source: (GAAM)
		‘Base’	‘Rapid recovery’	‘Lower for longer’	
Global oil demand	+1.8	+1.2	+1.6	+1.0	
Global oil supply	+2.6	+0.3	-0.9	+1.6	
OPEC-12 oil supply	+1.3	+0.9	+0.1	+1.6	
Saudi Arabia	+0.6	+0.1	-0.2	+0.3	
Iraq	+0.8	+0.2	-	+0.3	
Iran	-	+0.4	+0.3	+0.5	
Libya	-0.1	+0.2	-	+0.5	
Non-OPEC oil supply	+1.3	-0.6	-1.0	-	
US onshore	+0.8	-0.3	-0.5	-	
Other non-OPEC	+0.5	-0.3	-0.5	-	
Annual over/(under)supply	+0.8	-0.9	-2.5	+0.6	
Timing of market moving into undersupply		3Q 2016	1Q 2016	Beyond 2016	

Our ‘base’ case is that OECD oil and oil product inventories build during the start of 2016 (mainly as a result of Iranian oil production increases and the hangover of 2015 oversupply) before peaking in or around the third quarter and then declining towards more normal levels in the last few months of the year. If the data is supportive, it may give confidence to Saudi in seeking higher oil prices. Historically, the peak in inventories has also coincided with the trough in oil prices.



Between now and then, we could well see lower oil prices (\$20/bl has been mentioned by some market commentators as a potential low point for oil prices). We have seen before oil prices drop sharply lower at the bottom of the cycle, and there is the chance that this could happen again. Practically speaking, we could envisage a scenario where US shale oil production declines but is outweighed by sustained high levels of production from Saudi Arabia, a recovery in Libya and the resumption (at a high initial flush rate) of Iranian production. Compounded by a weak patch of global oil demand, we could see continued builds in OECD oil and oil product inventory levels until ultimately there would be nowhere left to store the oil. We could see \$20 per barrel temporarily in this scenario, but we feel that this would be the final resetting of the oil market. Historically, oil prices have bottomed in tandem with a combination of events such as

OPEC action, oil inventories becoming full, existing non-OPEC supply shut-ins and oil price forward curves moving into steep contango. The volatility and shape of the forward curve indicate that we are close to this today.

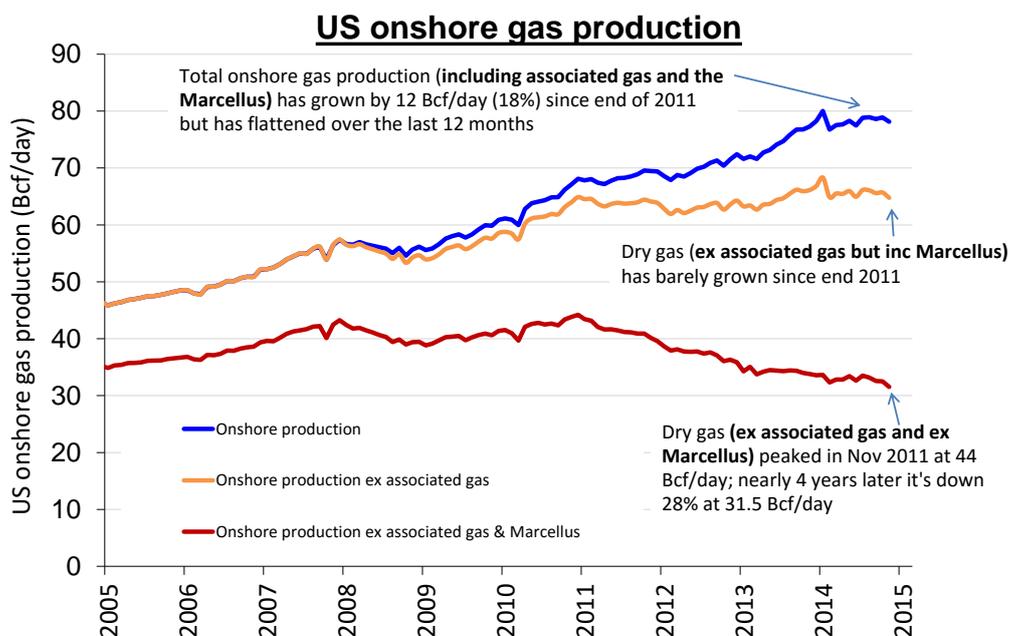
In 1986, 1998, and 2008 respectively the oil price fell from peak to trough by 66%, 60% and 70% respectively. If one takes the most recent oil price peak as being \$105/bbl (Brent), that gives \$35/bbl, \$31/bbl and \$42/bbl as the potential troughs. On two of those occasions (1998 and 2008) the oil price subsequently recovered by 200%, and on the other occasion (1986) by 100%. That gives a worst case outlook of \$62/bbl and best case outlook of \$126/bbl. We think our recovery to \$70-80/bbl is a good estimate, but higher than that is not off the table, in our opinion.

Item	Potential 'bottom-of-the-oil-cycle' events
Oil futures contango sharpens	A \$1/bbl per month contango would make floating storage economic and start to relieve OECD oil inventories, making supply/demand appear more balanced
OPEC action	Any announcement by OPEC that a co-ordinated supply cut is anticipated will indicate a bottom
Inventories full	If there is nowhere to store the excess oil, OPEC will be forced to cut. This is basically what happened in 1998/1999
Large scale M&A activity	An industry-led indication that oil prices will start to recover, as happened in 1998/1999 with the mega-mergers
Non-OPEC supply shut ins	If current production is uneconomic on a daily cash flow basis then oil prices have reached their trough. Cost deflation and strong USD has brought the cash cost of supply lower through 2015. Maybe \$25-30/bbl is needed to force shut-ins

Natural gas markets

The US natural gas market remained structurally over-supplied for most of 2015, the key features being:

- Year-on-year growth in associated (by-product) gas from shale oil production, albeit now in decline;
- Continued growth of the low-cost Marcellus and neighboring Utica fields in the north-east of the country, albeit at a significantly slower pace than in 2014;
- Strongest demand growth since 2010 (+4%), led by utility use of gas for electricity production, which was boosted by coal-to-gas switching and the mothballing of various coal-powered competitor plants;
- An extremely warm autumn/early winter 2015, which depressed heating demand for gas, pushed inventory levels to record highs and pushed the price below \$2/mcf.



The outlook for natural gas in 2016 is likely to be defined by a number of factors:

- A **shorter-term rebalancing of the market**, and recovery of price to around \$3/mcf, as the excess inventories created by warm weather are worked off by higher utility demand, stimulated by price;

- Continued **growth of supply in the Marcellus/Utica fields**, though only if local price differentials improve from current extreme levels;
- Declining **associated (by-product) natural gas** production growth as a result of the decline in shale oil production;
- **LNG exports**, which are due to start from the first completed facility, Sabine Pass (capacity of 2.2 Bcf/day), in early 2016. LNG export facilities with total capacity of 10.1 Bcf/day are scheduled for completion by the end of 2019, with the amount of gas exported ultimately a function of the differential between US and international gas prices; Source: EIA
- A positive response from **industrial natural gas demand** as new petrochemicals and fertilizer plants are completed;
- Steady replacement of the coal utility fleet by new gas-fired electricity generation plants.

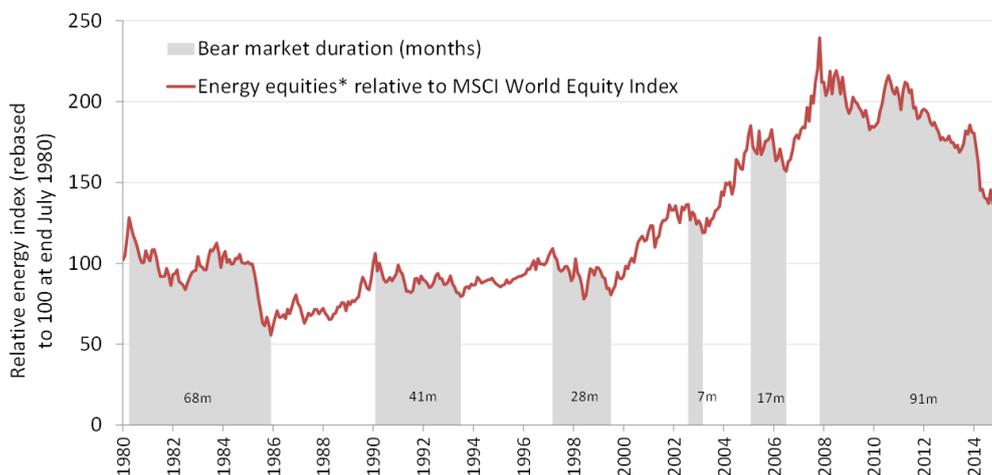
The US natural gas price bottomed in 2012 and a tepid recovery since then has been muted by continued strength in gas supply, particularly from the Marcellus and from gas produced as a by-product of shale oil. Average 2015 natural gas prices (at around \$2.63) are well below the marginal cost of supply (which is over \$3.50). We do not believe the excess in production over demand can continue indefinitely with natural gas trading at this level: a combination of reduced capital spending by the producing companies and growing natural gas demand stimulated by the low gas price will create a new market equilibrium. As this all happens, we expect the price to stabilize in the \$2.50-3.50 range. It may be held at this level for a period until demand grows further, and longer term we expect the price to normalize to \$3.50+.

Energy equities

Energy equities have traded off sharply for a second year in sympathy with the falling oil price. They have now underperformed the broad market for longer than they did between 1979 and 1986, and indeed for longer than they did after any of the large price declines since 1970.

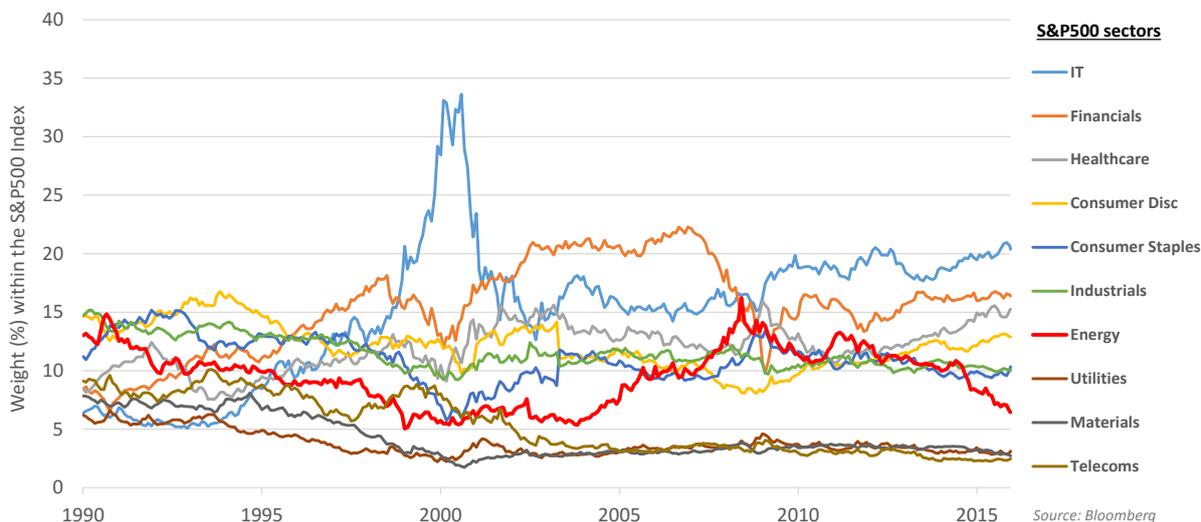
Energy equities versus the MSCI World Equity Index

Source: Bloomberg



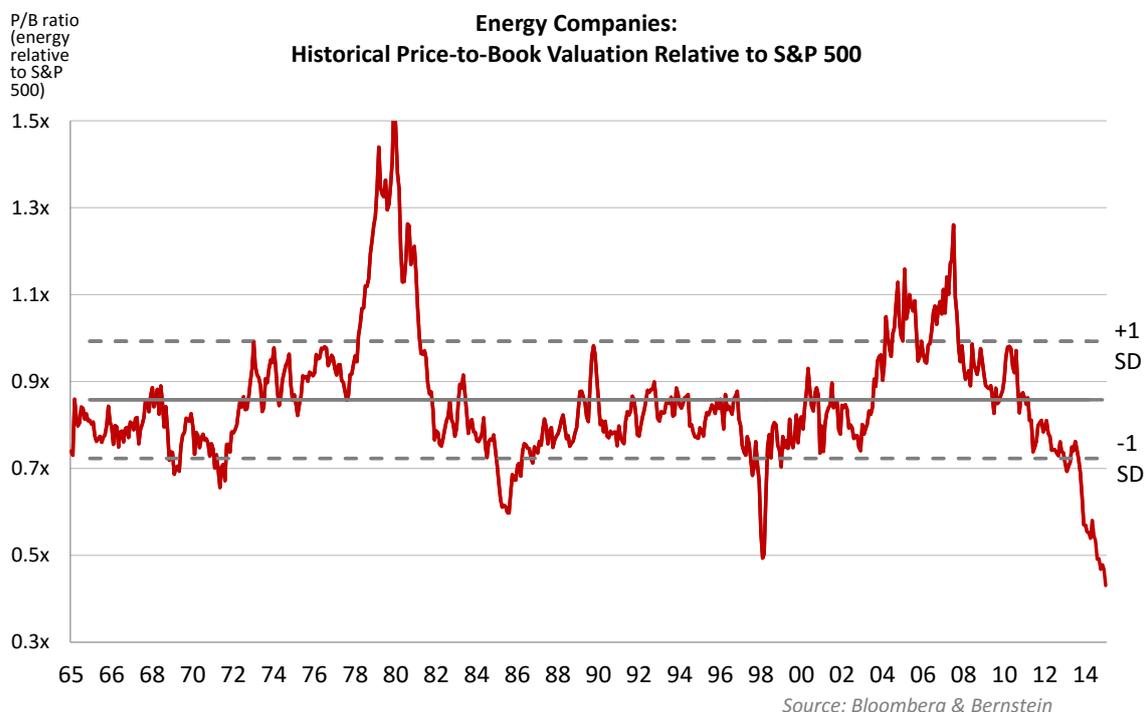
* MSCI World Energy Index since its inception Feb 1995; prior period is basket of Exxon, Chevron, Hess, Occidental, Murphy, BP, Marathon & Conoco Phillips (i.e. the oil majors in existence throughout the prior period shown)

We also observe that the capitalization weighting of energy in the S&P500 at the end of 2015 was 6.4%, close to its historic lows. Since 1990, energy as a proportion of the S&P 500 has ranged between 5.1% and 16.2%, with an average weighting of 9.5%.



The valuation sensitivity work that we regularly perform tells us that energy equities are today discounting an oil price (into perpetuity) of around \$55/barrel, so well above the current spot oil price but in line with the four year forward prices for both the Brent and WTI benchmarks. If you believe (as we do) that a recovery in the oil price to \$70-80/bl is likely.

On a relative price-to-book (P/B) basis (versus the S&P500), the valuation of energy equities is the lowest over the 50 year period that we have data for (back to 1965). The relative price-to-book for energy equities has therefore fallen below the level seen in 1998 (when the oil price fell from \$38 to \$12 per barrel, in current USD) and 1986 (when the oil price fell from the mid \$60s to around \$20 per barrel (also in current USD)).



We showed this graph in our energy equity outlook at the start of 2015, and think it is relevant to include again now. It comes as no surprise that the P/B ratio for energy equities is at a very low level, being closely correlated with return-on-capital which remains in a highly depressed state. And if the corporate oil and gas sector is unable to produce a return close to their cost of capital, it is another way of expressing the view that oil and gas prices are too low and will – in time – recover, and pull energy equity valuations and returns higher with them.

In the meantime, the industry has seen a reasonable level of M&A activity, from the expected Royal Dutch Shell-BG 'mega-merger', to oil sands (Suncor-Canadian Oil Sands), to energy services (Schlumberger-Cameron), to US E&P (Noble-Rosetta), to international E&P (ENOC-Dragon Oil), to name a few announced in 2015. The opportunity is there for M&A activity to accelerate in 2016 (though we hear that 'bid-ask spreads', particularly in the E&P world, remain fairly wide), and is likely again to be seen across the various energy sub-sectors.

In the shorter-term, stock selection remains paramount, as we traverse the tightrope of low oil prices and, in many cases, geared balance sheets. However, if you believe, as we do, that a recovery in the oil price to \$70-80/bl is likely, the case for accumulating energy equities at this level looks good.

Will Riley, Jonathan Waghorn & Tim Guinness
January 2016

Opinions expressed are those of Guinness Atkinson Funds, are subject to change, are not guaranteed and should not be considered investment advice.

The Fund's investment objectives, risks, charges and expenses must be considered carefully before investing. The statutory and summary prospectus contains this and other important information about the investment company, and it may be obtained by calling 800-915-6566 or visiting gafunds.com. Read it carefully before investing.

The Fund's holdings, industry sector weightings and geographic weightings may change at any time due to ongoing portfolio management. References to specific investments and weightings should not be construed as a recommendation by the Fund or Guinness Atkinson Asset Management, Inc. to buy or sell the securities. Current and future portfolio holdings are subject to risk.

Mutual fund investing involves risk and loss of principal is possible. The Fund invests in foreign securities which will involve greater volatility, political, economic and currency risks and differences in accounting methods. The Fund is non-diversified meaning it concentrates its assets in fewer individual holdings than a diversified fund. Therefore, the Fund is more exposed to individual stock volatility than a diversified fund. The Fund also invests in smaller companies, which involve additional risks such as limited liquidity and greater volatility. The Fund's focus on the energy sector to the exclusion of other sectors exposes the Fund to greater market risk and potential monetary losses than if the Fund's assets were diversified among various sectors. The decline in the prices of energy (oil, gas, electricity) or alternative energy supplies would likely have a negative effect on the funds holdings.

S&P 500 Index is a broad based unmanaged index of 500 stocks, which is widely recognized as representative of the equity market in general.

MSCI World Energy Index is a free-float weighted equity index based on the energy sector.

MSCI World Index is a capitalization weighted index that monitors the performance of stocks from around the world.

One cannot invest directly in an index.

Price to Book Ratio (P/B) is used to compare a stock's market value to its book value and is calculated by dividing the current closing price of the stock by the latest quarter's book value per share.

Return on Capital is a return from an investment that is not considered income. The return of capital is when some or all of the money an investor has in an investment is paid back to him or her, thus decreasing the value of the investment.

Contango is a situation where the futures price of a commodity is above the expected future spot price.

The Compound Annual Growth Rate (CAGR) is the mean annual growth rate of an investment over a specified period of time longer than one year.

OPEC-12 are the 12 countries that make up OPEC (Organization of Petroleum Exporting Countries): Venezuela, Saudi Arabia, Iran, Iraq, Kuwait, United Arab Emirates (UAE), Libya, Nigeria, Qatar, Algeria, Angola, Ecuador

Bid-Ask Spread is the amount by which the ask price exceeds the bid.

CAPEX or Capital Expenditure are funds used by a company to acquire or upgrade physical assets such as property, industrial buildings or equipment.

[Click Here](#) for Top 10 Holdings of the Guinness Atkinson Global Energy Fund

Top 10 holdings as of 12/31/2015: 1. Apache Corp 4.36% 2. OMV AG 4.34% 3. Valero Energy Corp 4.16% 4. Suncor Energy Inc 4.07% 5. Canadian Natural Resources Ltd 4.04% 6. Noble Energy Inc 3.94% 7. Newfield Exploration Co 3.93% 8. Occidental Petroleum Corp 3.84% 9. CNOOC Ltd 3.83% 10. Exxon Mobil Corp 3.80%

Distributed by Quasar Distributors, LLC
