Global Energy: what does 2017 hold for the oil market and energy equities?

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Guinness Atkinson Global Energy: summary

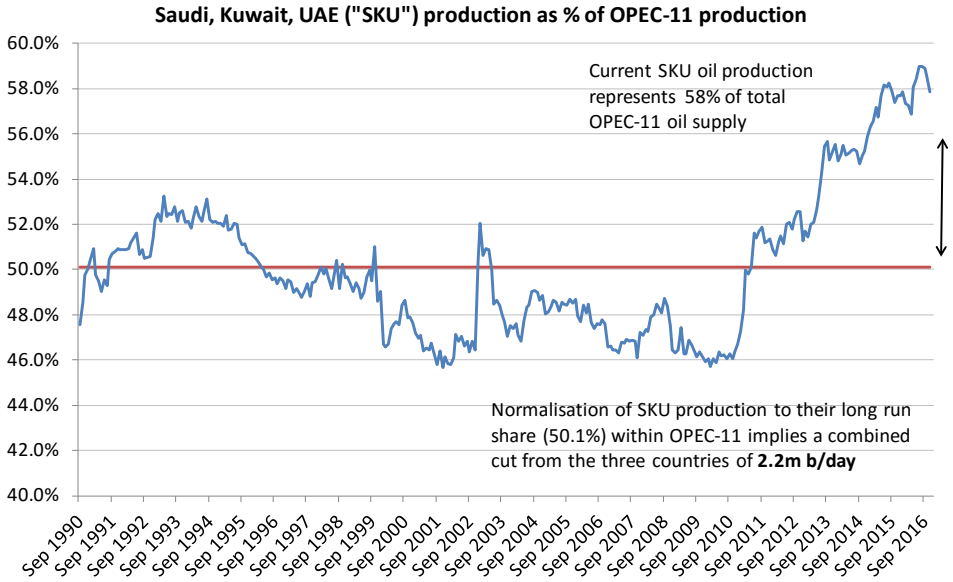
- **OPEC cuts**: confirmation in November 2016 of 1.2m b/day reduction, the first supply cut since 2008. Supported by 0.6m b/day of announced non-OPEC cuts
- **Oil market close to being in balance before the OPEC/non-OPEC supply cut**... ….moving to deficit in 2017
- **Oil price on a journey back to $70/bbl, in our opinion**
- **US natural gas market: has moved into undersupply**
- **Energy equities outperformed in 2016:** but, in our analysis, the rebound still leaves the sector a long way from historical normalised valuation levels

Source: Bernstein, Guinness Atkinson Asset Management, Jan 2017

OPEC oil supply: largest cuts to come from Saudi, Kuwait & UAE

- In Nov 2016, OPEC announced a cut of 1.5m b/day with non-OPEC adding 0.6m b/day
- Cuts fall mostly on Saudi, Kuwait and UAE whose share of OPEC production has increased to 58% from c.48% in 1990
- Libya and Nigeria are exempt from quota cuts
- The cuts are effective from 1 January 2017 for six months

Saudi, Kuwait and UAE production (k b/day)



OPEC quotas (m b/day)

(m b/day)	Oct 2016*	Adjustment	Jan 2017	% adjustment
Saudi	10.54	-0.49	**10.05**	-5%
Iran	3.70	0.09	**3.79**	2%
Iraq	4.56	-0.21	**4.35**	-5%
UAE	3.01	-0.14	**2.87**	-5%
Kuwait	2.84	-0.13	**2.71**	-5%
Nigeria	1.60	*exempt*	**1.60**	*n/a*
Venezuela	2.07	-0.10	**1.97**	-5%
Angola	1.75	-0.09	**1.66**	-5%
Libya	0.42	*exempt*	**0.42**	*n/a*
Algeria	1.09	-0.05	**1.04**	-5%
Qatar	0.65	-0.03	**0.62**	-5%
Indonesia	0.74	*suspended*	**0.74**	*n/a*
Gabon	0.20	-0.01	**0.19**	-5%
Ecuador	0.55	-0.03	**0.52**	-5%
OPEC-14	**33.72**	**-1.19**	**32.53**	**-4%**

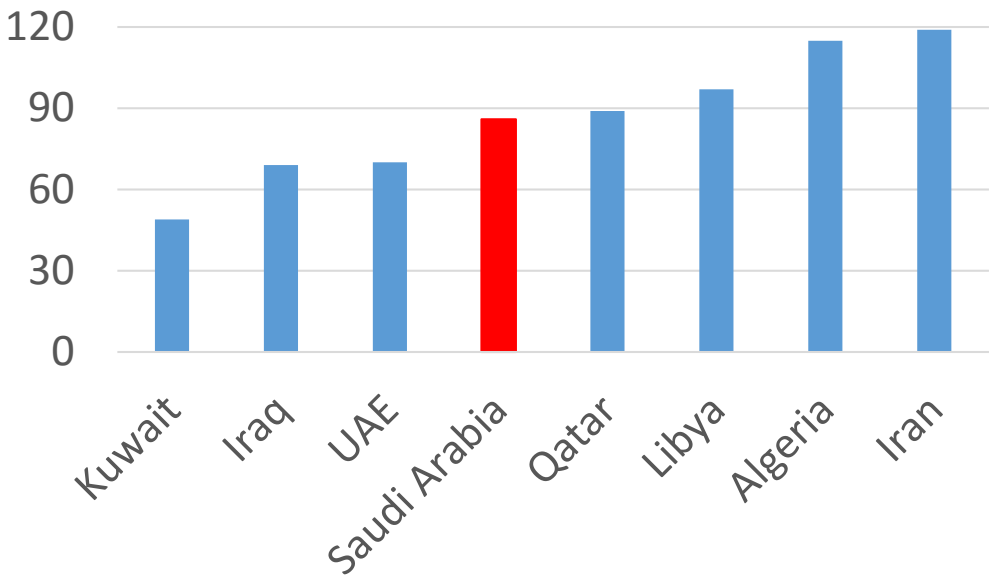
Source: IEA; Bloomberg (data as of Jan 2017)

OPEC: why have they announced a production cut?

- OPEC's statement, accompanying the announcement of cuts, says:

"*In the last two years… Oil-exporting countries' and oil companies' revenues have dramatically declined, putting strains on their fiscal position and hindering their economic growth. The oil industry faced deep cuts in investment and massive layoffs, leading to a potential risk that oil supply may not meet demand in the future, with a detrimental effect on security of supply.*"

OPEC (selected) fiscal breakeven oil prices 2016 ($/bbl)



- Saudi are running highest budget deficit within the G20
- Cuts to Saudi ministerial salaries of 20% announced in September
- Payment delays to contractors in Saudi being reported
- Financial pressures even greater in 'tier 2' OPEC (e.g. Iraq; Nigeria; Venezuela; Ecuador)

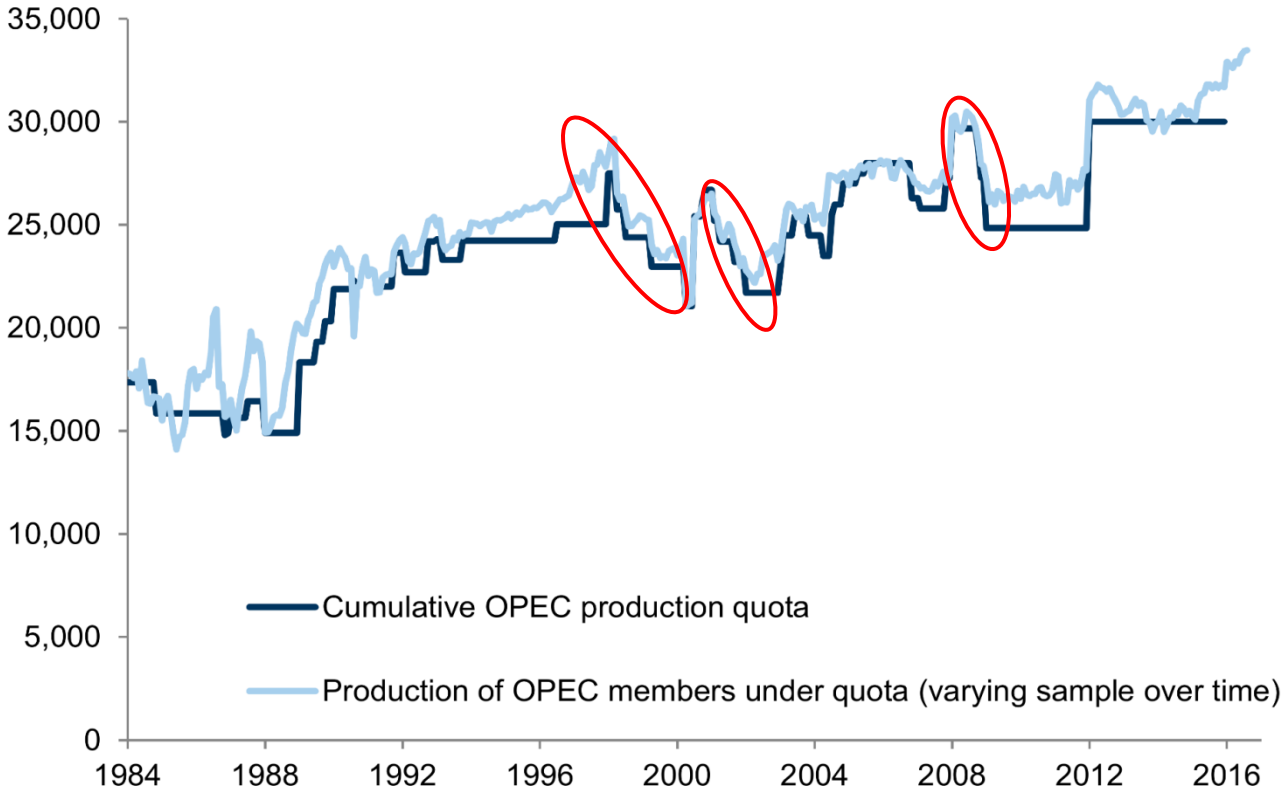
Source: Bernstein, IEA, Guinness Atkinson Asset Management, Dec 2016

OPEC: will they comply with the quota cut?

- OPEC has historically produced at levels in excess of its quotas, however…

  …compliance with quota cuts in 1998, 2002 and 2009 were broadly at targeted level

OPEC production vs quota (k b/day)



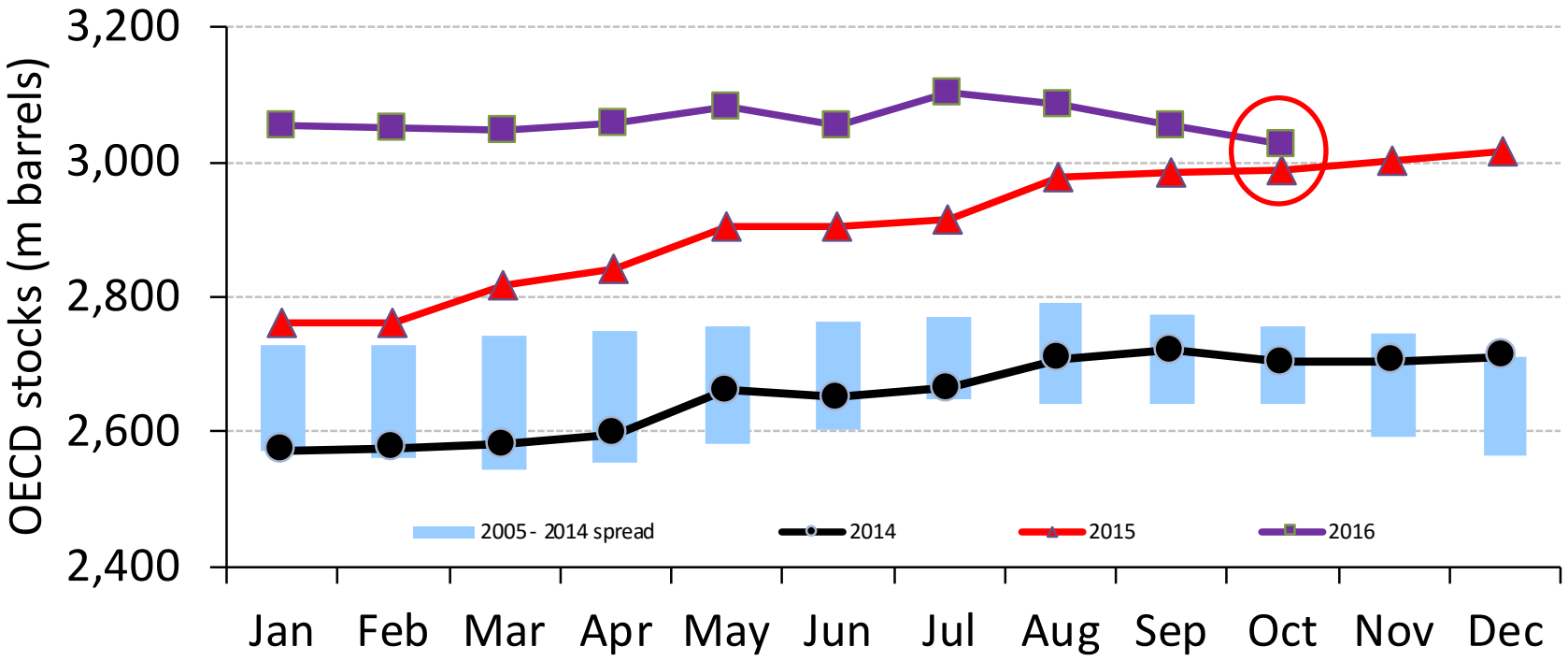
Source: Goldman Sachs, Guinness Atkinson Asset Management, (data to June 30 2016)

Oil supply/demand: OECD inventories starting to normalise

- In 2015, OECD inventories moved well above the top of the ten year range…

  ….the move implied average oversupply of c.0.8m b/day
- In the nine months to the end of Sept 2016, the oversupply has fallen to 0.1m b/day

OECD oil inventories (million bbls)

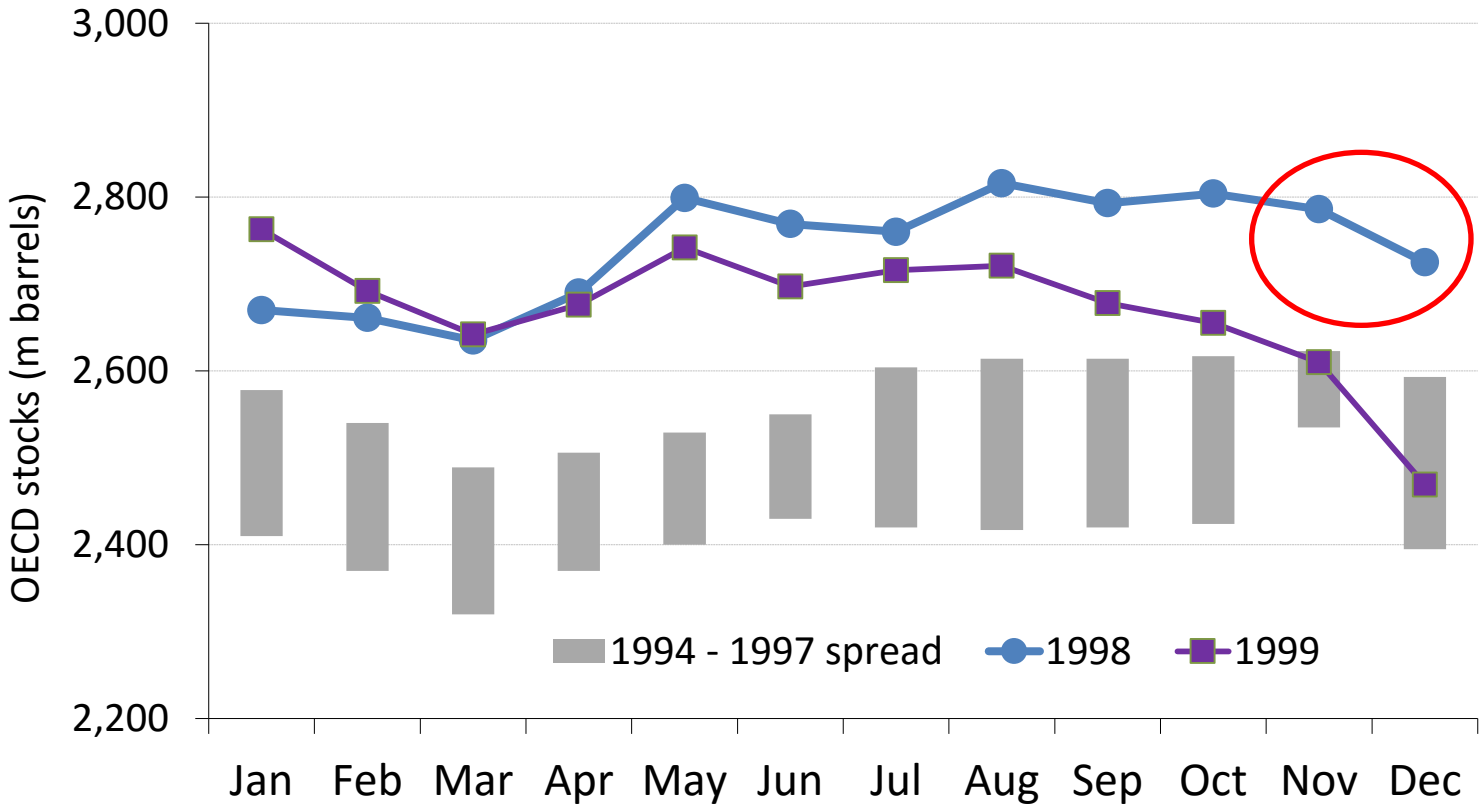


Source: IEA Oil Market Report (Dec 2016; data to October 2016); Guinness Atkinson Asset Management

OPEC: Inventories - parallel with 1998-99 down cycle

- In the 1998/99 downcycle, oil inventories peaked at around 300m above average…
  …. very similar to magnitude of oversupply in 2015/16
- Oil price recovery and end of 1998 coincided with inventories starting to fall

OECD oil inventories 1994-1999 (million bbls)



Source: IEA Oil Market Reports (1994-1999); Guinness Atkinson Asset Management

Near term oil demand: world oil demand up 1.3m b/day in 2016

- 2016 world oil demand forecast to be around 9.1m b/day up on pre-recession peak (2007)
- Non-OECD demand has grown unchecked through the oil price spike and financial crisis of 2008/09
- Demand growth in 2015 of 1.9m b/day highest since 2010, spurred on by low price
- Estimates for 2016 and 2017 indicate healthy demand growth of 1.4m and 1.3m b/day

Global oil demand (m b/day)

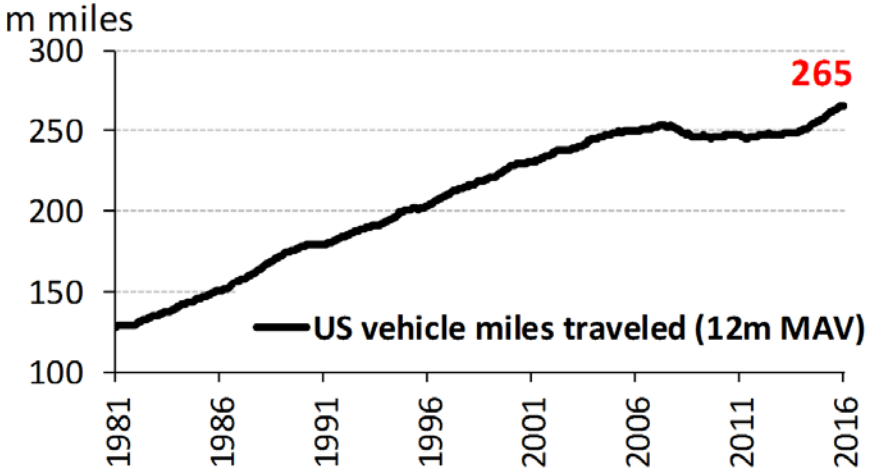
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
OECD demand													IEA	IEA
North America	25.7	25.8	24.5	25.8	24.5	23.7	24.1	24.0	23.6	24.2	24.2	24.6	24.6	24.6
Europe	15.6	15.7	15.7	15.6	15.5	14.7	14.7	14.3	13.8	13.6	13.5	13.7	13.9	13.9
Pacific	8.8	8.9	8.7	8.7	8.3	8.0	8.2	8.2	8.5	8.3	8.1	8.0	8.1	8.0
Total OECD	**50.1**	**50.4**	**48.9**	**50.1**	**48.3**	**46.4**	**47.0**	**46.5**	**45.9**	**46.1**	**45.8**	**46.4**	**46.6**	**46.6**
Change in OECD demand		*0.3*	*-1.5*	*1.2*	*-1.8*	*-1.9*	*0.6*	*-0.5*	*-0.6*	*0.2*	*-0.3*	*0.6*	*0.2*	*0.0*
NON-OECD demand														
FSU	3.8	3.9	4.0	4.0	4.2	4.0	4.1	4.4	4.6	4.5	4.7	4.6	4.8	4.9
Europe	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.7
China	6.4	6.7	7.2	7.6	7.7	7.9	8.9	9.3	9.9	10.4	10.8	11.5	11.9	12.2
India	2.6	2.6	2.7	2.9	3.1	3.2	3.3	3.5	3.7	3.7	3.8	4.0	4.3	4.5
Other Asia	6.4	6.4	6.6	6.9	6.8	7.1	7.5	7.6	7.6	7.9	8.2	8.5	8.8	9.2
Latin America	4.9	5.0	5.2	5.3	5.6	5.7	6.1	6.2	6.5	6.6	6.8	6.8	6.7	6.7
Middle East	5.5	5.9	6.1	6.4	6.7	7.1	7.3	7.5	7.9	8.0	8.4	8.4	8.4	8.6
Africa	2.8	2.9	2.9	3.3	3.3	3.4	3.5	3.5	3.8	3.8	3.8	4.1	4.2	4.3
Total Non-OECD	**33.1**	**34.1**	**35.4**	**37.1**	**38.1**	**39.1**	**41.4**	**42.7**	**44.8**	**45.6**	**47.2**	**48.5**	**49.7**	**51.0**
Change in non-OECD demand		*1.0*	*1.3*	*1.7*	*1.0*	*1.0*	*2.3*	*1.3*	*2.1*	*0.8*	*1.6*	*1.3*	*1.2*	*1.3*
Total Demand	**82.5**	**83.8**	**85.1**	**87.2**	**86.4**	**85.5**	**88.4**	**89.2**	**90.7**	**91.7**	**93.0**	**94.9**	**96.3**	**97.6**
Change in demand		*1.3*	*1.3*	*2.1*	*-0.8*	*-0.9*	*2.9*	*0.8*	*1.5*	*1.0*	*1.3*	*1.9*	*1.4*	*1.3*

Source: IEA Oil Market Report December 2016

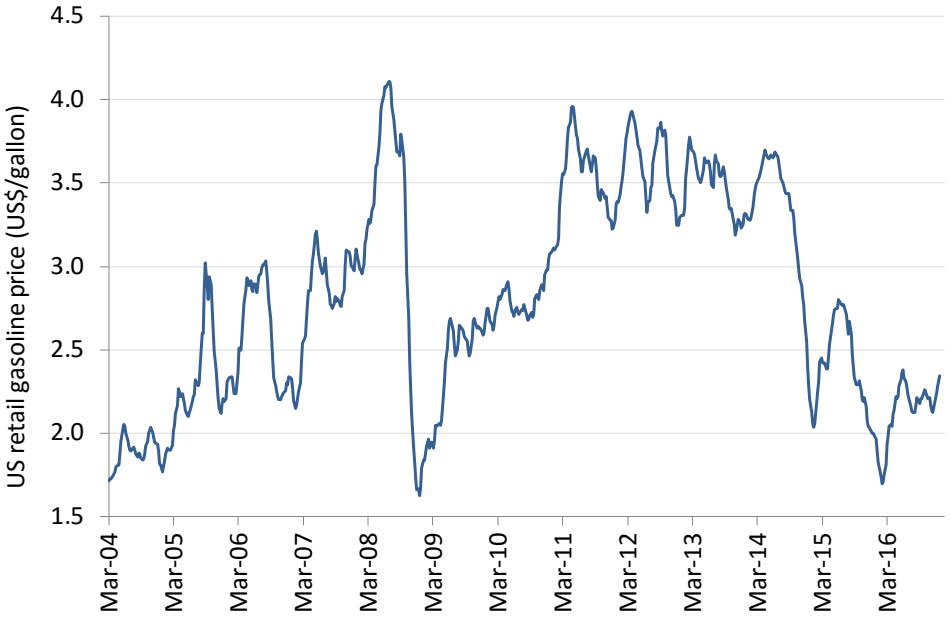
Near term oil demand: US demand picking up

- US oil demand fell from c.20m b/day to c.19m b/day, between 2001 and 2012
- Lower domestic oil and gasoline prices now driving positive US oil demand growth
- 'Vehicle Miles Travelled' in the US has resumed an upward trend since 2014
- Retail gasoline is still less than $2.50/gallon, with Brent oil prices at c.$55/bbl
- We would expect demand growth to stay robust as a result of weak oil prices

US total vehicle miles travelled (1981-2016)



US retail gasoline prices (US$/gallon)



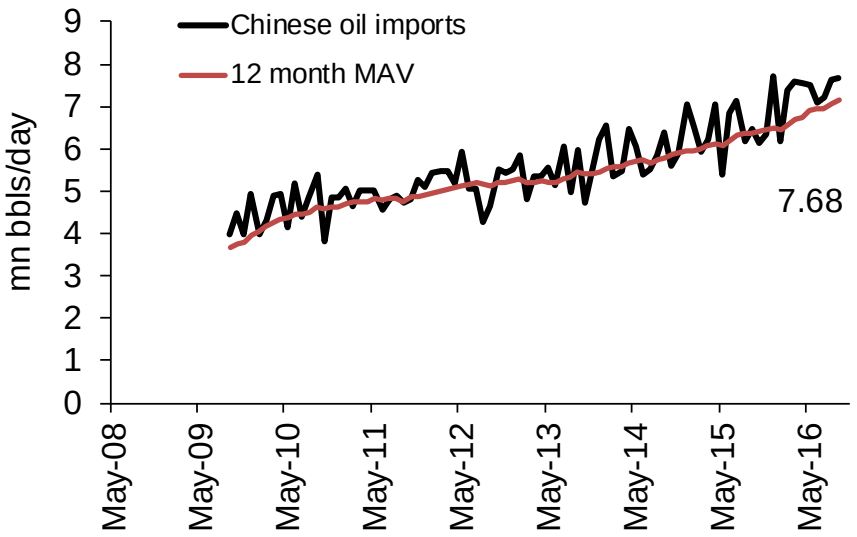
Source: Bloomberg LP; Guinness Atkinson Asset Management (data to Dec 31 2016)

Near term oil demand: Chinese oil demand still looks ok

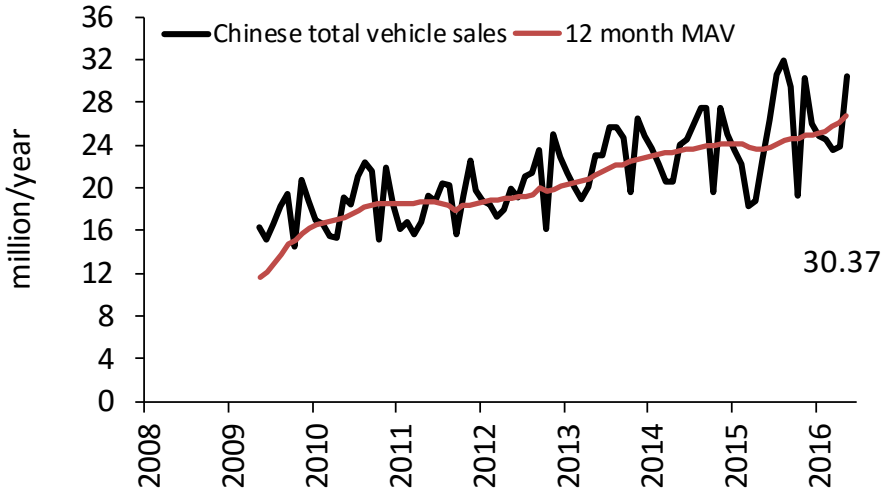
- China 2015 apparent oil demand up 6.5% vs 2014 (strongest yoy growth since 2011)
- IEA estimates for 2016 and 2017 indicate 0.3m b/day pa growth on average
- China's Strategic Petroleum Reserve was estimated to be 235mn bls in early 2016
- The rate of build appears to be around 100-200k b/day….

  ….This represents 30 days of oil import coverage; the target is 90 days by 2020

China oil imports



China total vehicle sales

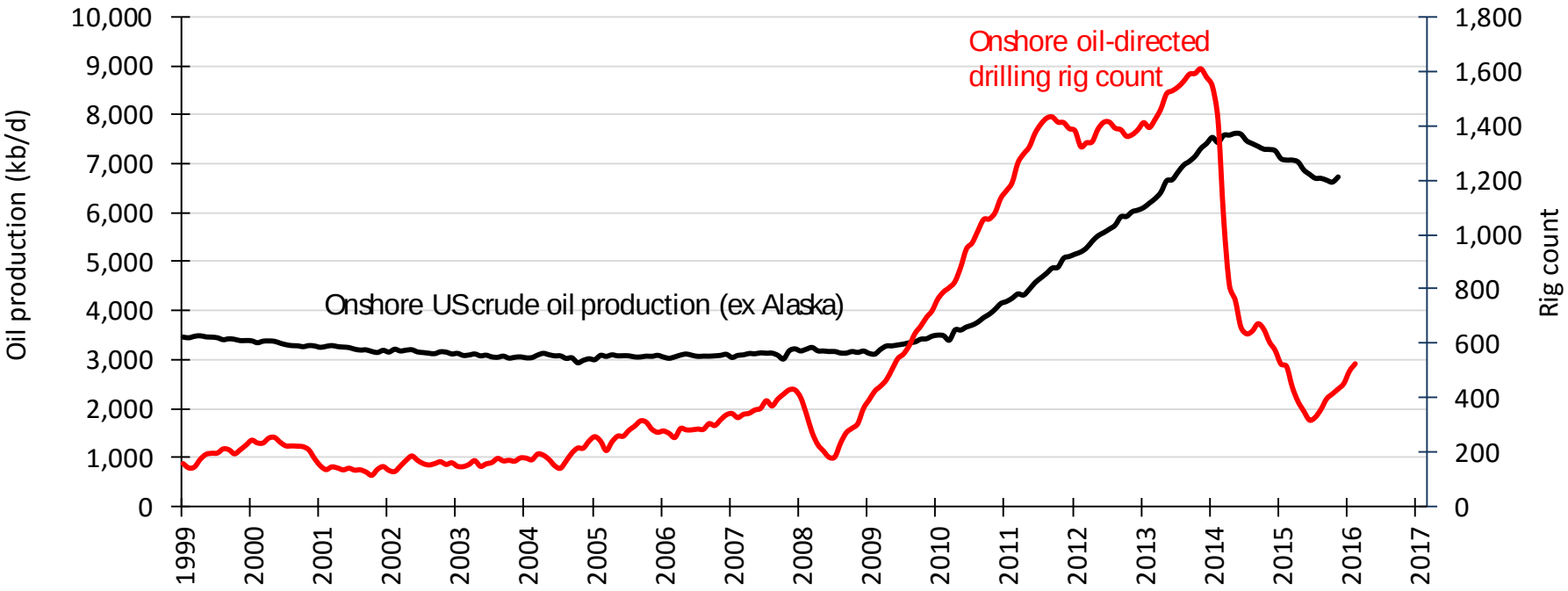


Source: Bloomberg LP; Credit Suisse; Guinness Atkinson Asset Management (data as of end November 2016)

Non-OPEC oil supply: US onshore production and rig count

- US onshore (ex Alaska and GoM) oil supply was 6.72m b/day in October 2016
- The US oil directed rig count fell from over 1,600 rigs to 330 rigs at end June 2016
- US onshore oil peaked in Apr 2015 at 7.65m b/day and fell to 6.62m b/day in Sept 2016
- The oil directed rig count has recovered to 525 rigs at the end of 2016
- The decline of US onshore oil production has slowed and production is now flattening

US onshore oil production vs oil rig count (table shows US onshore total rig count by shale basin



Source: EIA (oil production to Oct 2016); Bloomberg (oil rig count) as Jan 4 2017

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Non-OPEC oil supply: US oil supply response

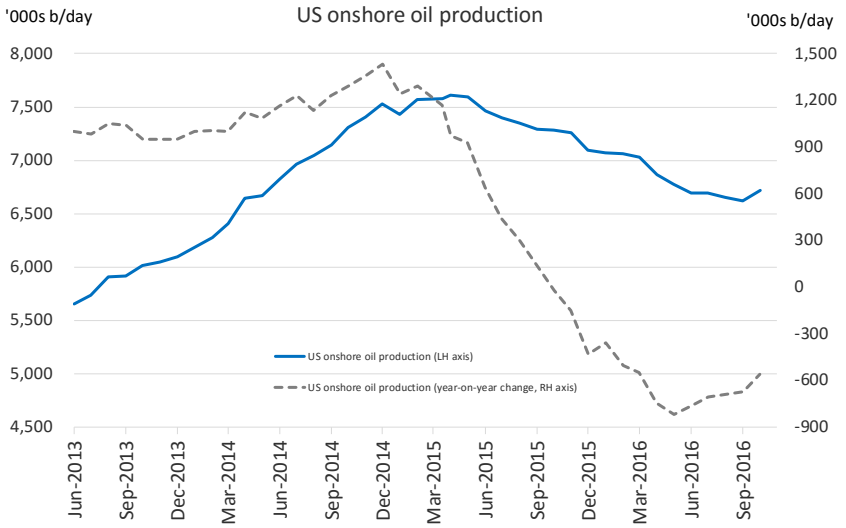
- We expect marginal investment (from higher oil prices) to be invested in US shale
  - The resource is available, payback is quick and technical, fiscal and political risks are low
- Too great a level of investment will bring too much oil onstream too quickly
- Efficiency gains will compete with cost inflation and infrastructure access
- We believe that a trajectory from $45/bl today towards $70/bl will be required
  - Delivering some growth in 2017/2018 as markets rebalance
  - Delivering more growth in 2019/2020 as non-OPEC ex-US sees production declines

Potential trajectories for US onshore oil production

Brent oil price	Production change
$40/bl	Declining around 0.3-0.5m b/day
$50/bl	Broadly flat
$60/bl	Increasing around 0.3-0.5m b/day
$70/bl	Increasing around 0.6-1.0m b/day

US onshore oil production (kb/day)

Actual production and annual change



Source: Guinness Atkinson Asset Management estimates, Company data, as of Jan 2017

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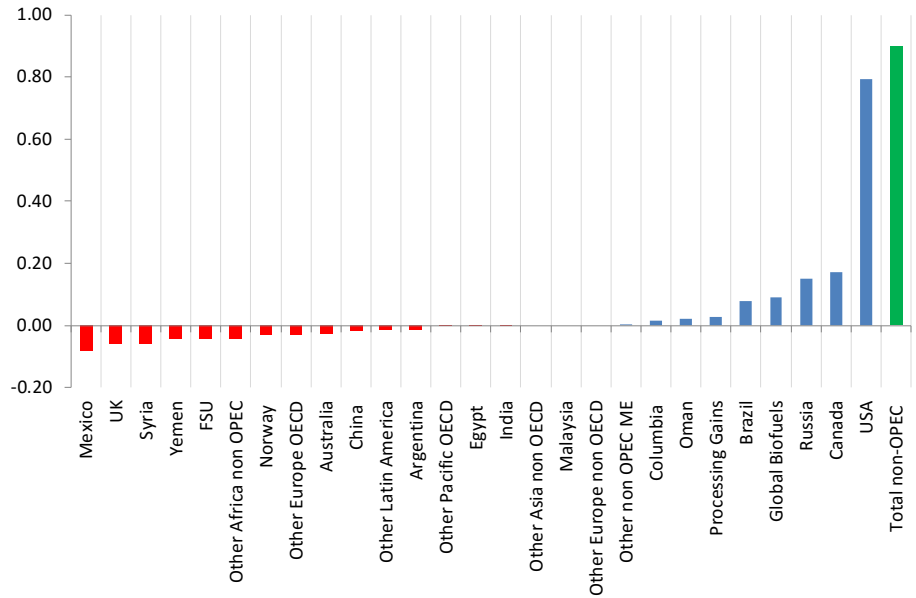
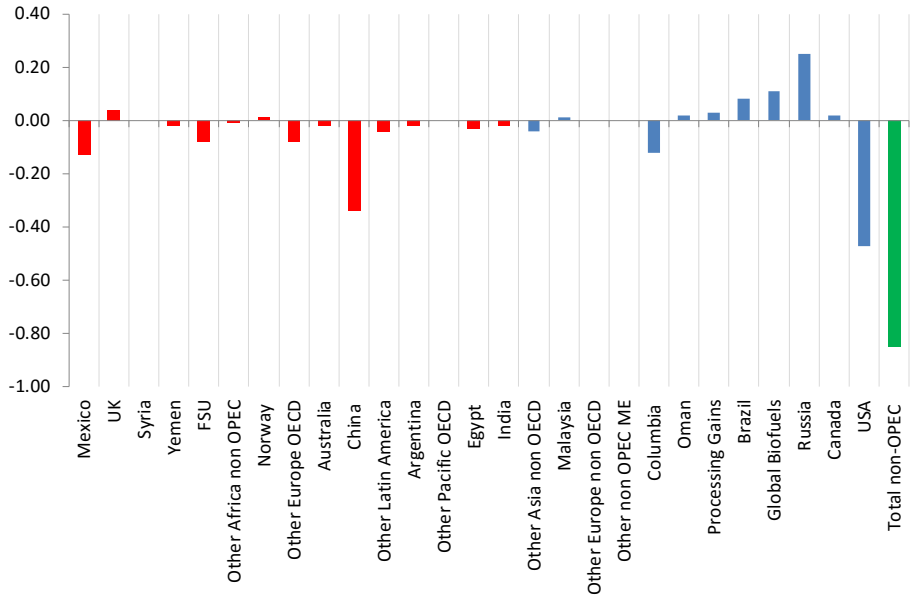
Non-OPEC supply: Russia/Brazil the only regions growing in 2016

- North America delivered all of non-OPEC oil production growth over the last six years
- Despite $100 oil and high capex levels, other non-OPEC countries had flat production
- 2016 non-OPEC oil is estimated down 0.85m b/day, with a US decline 0.5m b/day
- In 2016, China declined by over 0.3m b/day while Brazil and Russia grew
- We expect most countries to see sharp slowing in production growth in 2017 and 2018

Non-OPEC oil growth: 2016 vs 2010 pa (m b/day)



Non-OPEC oil growth: 2016 vs 2015 (m b/day)



Source: IEA, Guinness Atkinson Asset Management (Jan 2017)

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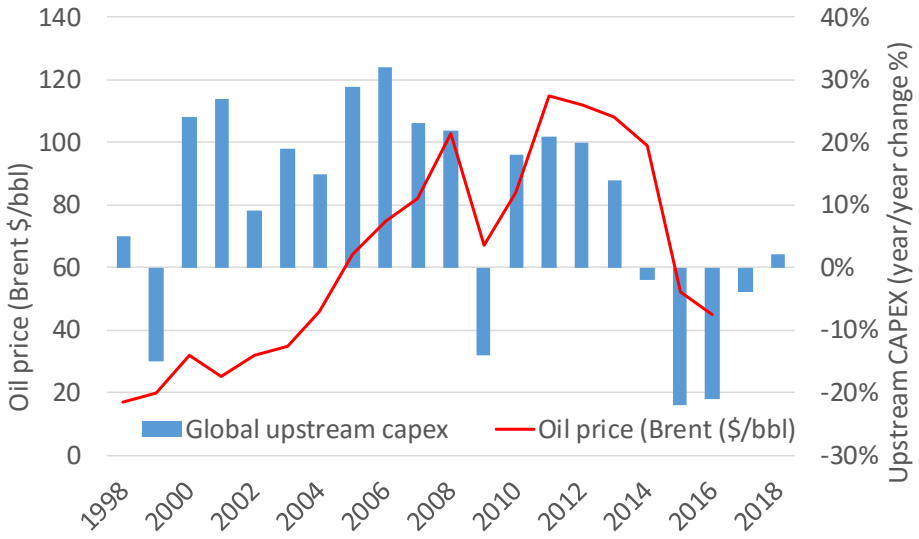
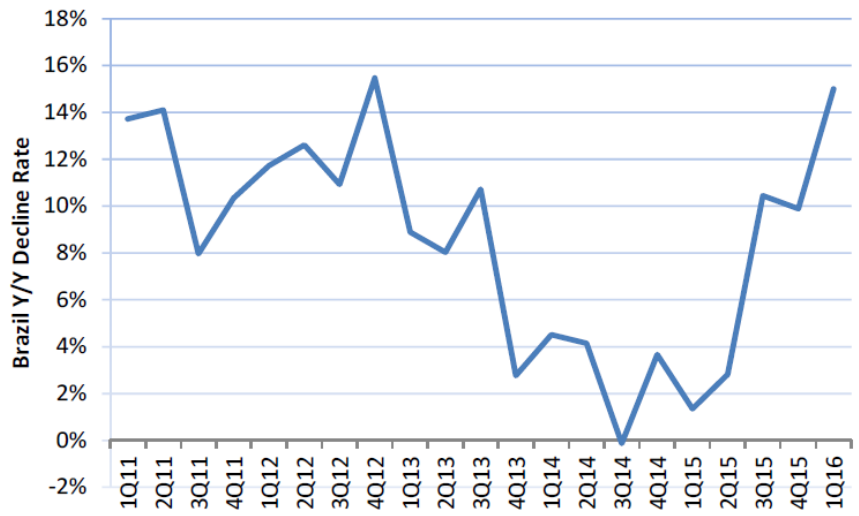
Non-OPEC oil supply (ex-US): upstream capex has fallen sharply

- Global upstream capex has fallen by more than 20%pa in both 2015 and 2016
- This is a larger and longer decline than those seen in 2008/2009 and 1998/1999
- The effect is twofold:
  1. The 'decline rate' on existing production starts to increase
  2. The rate of new non-OPEC project start-ups slows
- There is a time delay between oil prices falling and non-OPEC production reacting

Year over year change in global upstream capex



Decline rates on current Brazil oil production



Source : Simmons International, LH chart: data forecast to 2018; RH chart: data to end 1Q 2-16

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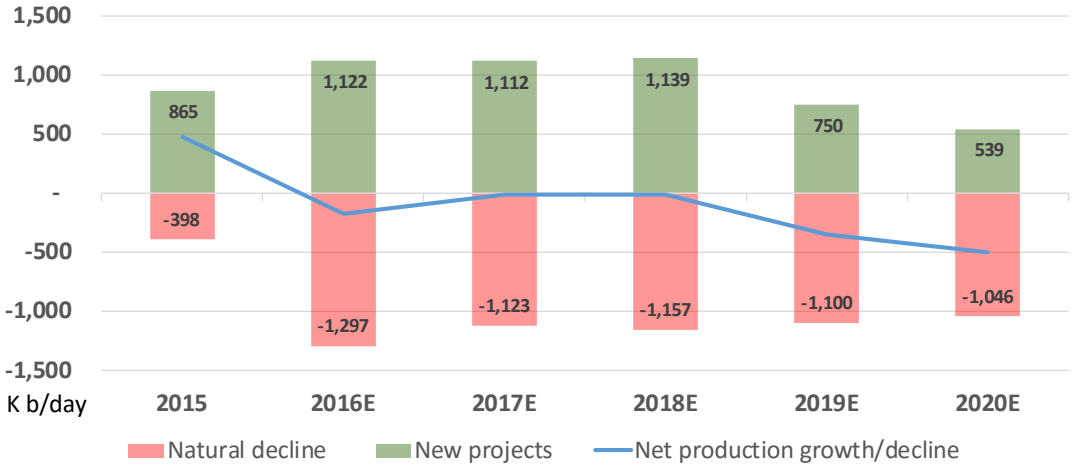
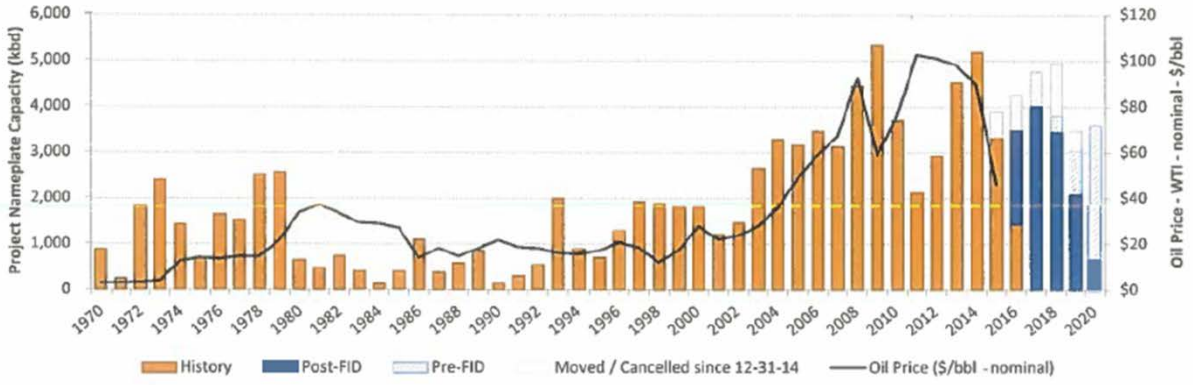
Non-OPEC oil supply (ex-US): production flat to declining

- Non-OPEC supply (ex-US) expected to be flat in 2017/18, then decline in 2019/20

Top 10 non-OPEC producers (ex-US): forecast to 2020



Major non-OPEC (ex-US onshore) project start-up schedule



Biggest sources of net new supply and decline to 2020:

- Brazil (+1.2m b/day)
- Canada (+0.4m b/day)
- UK (+0.2m b/day)
- Russia (-0.6m b/day)
- China (-0.7m b/day)

Source : Tudor Pickering Holt, Kessler Energy, Guinness Atkinson Asset Management, Jan 2017

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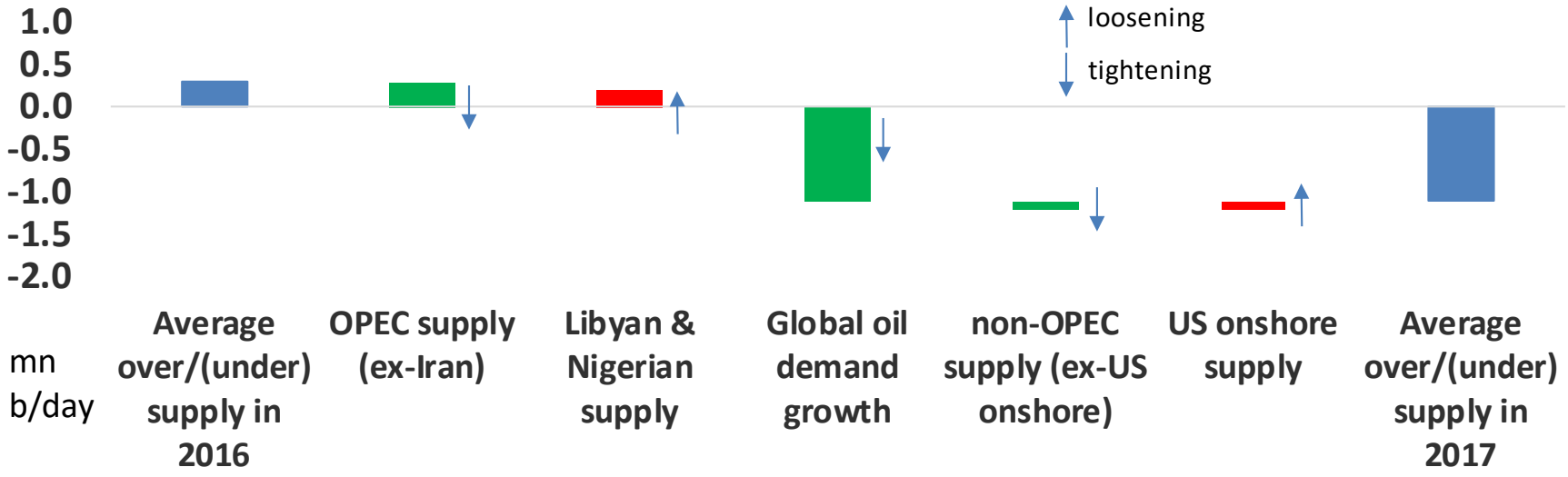
Inventories – the path to a tighter market in 2017

- As ever, the picture of oil supply and demand in 2017 will be dynamic
- Our 'base' case shows that the oil market is likely to be undersupplied in 2017, by something over 1m b/day
- We assume that the market averaged 2016 in slight oversupply (c.0.3m b/day)
- 'Core' OPEC cuts and growing global oil demand tighten the market
- Recovering production in Libya, Nigeria and US production growth loosen the market

2017 forecast global oil market balance (assuming OPEC deal is adhered to)

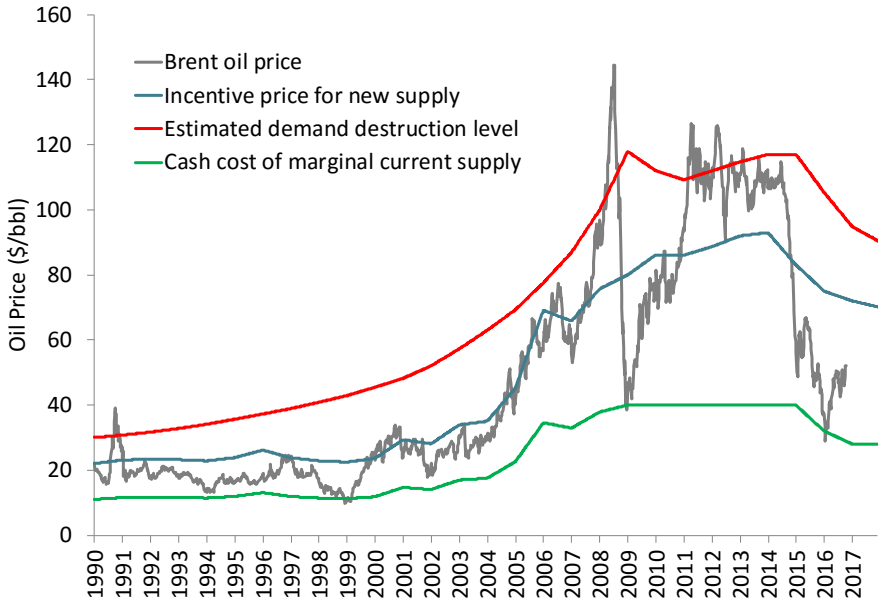


Source: Guinness Atkinson Asset Management

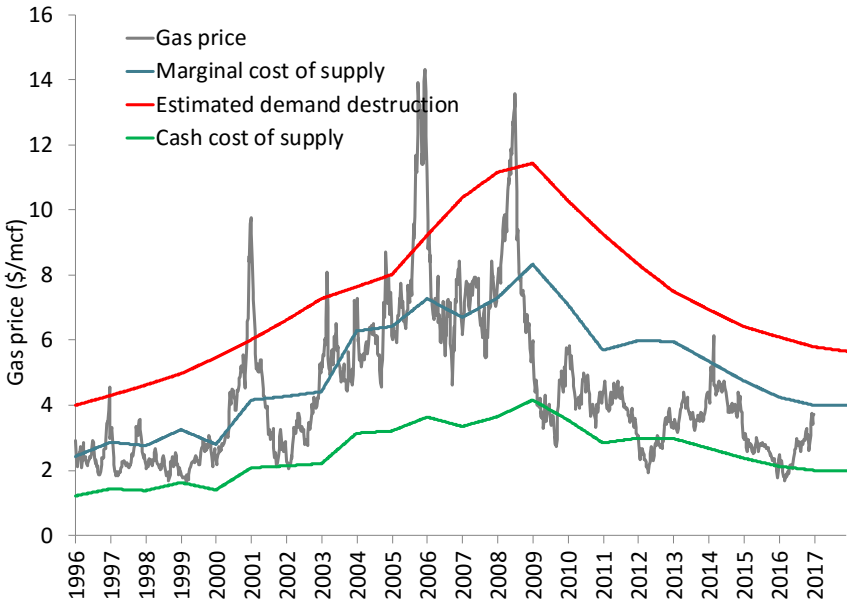
Economics: marginal cost of supply has historically defined prices

- Historically, both crude oil and natural gas commodity prices have traded between the cash cost of supply and the price at which demand is destroyed
- Crude oil has rebounded this years from the marginal cash cost of supply, estimated to be the cost of running large scale Canadian oil sands and mature North Sea facilities
- Henry Hub natural gas is trading at around the cash cost of current marginal supply

Economics of crude oil



Economics of US natural gas

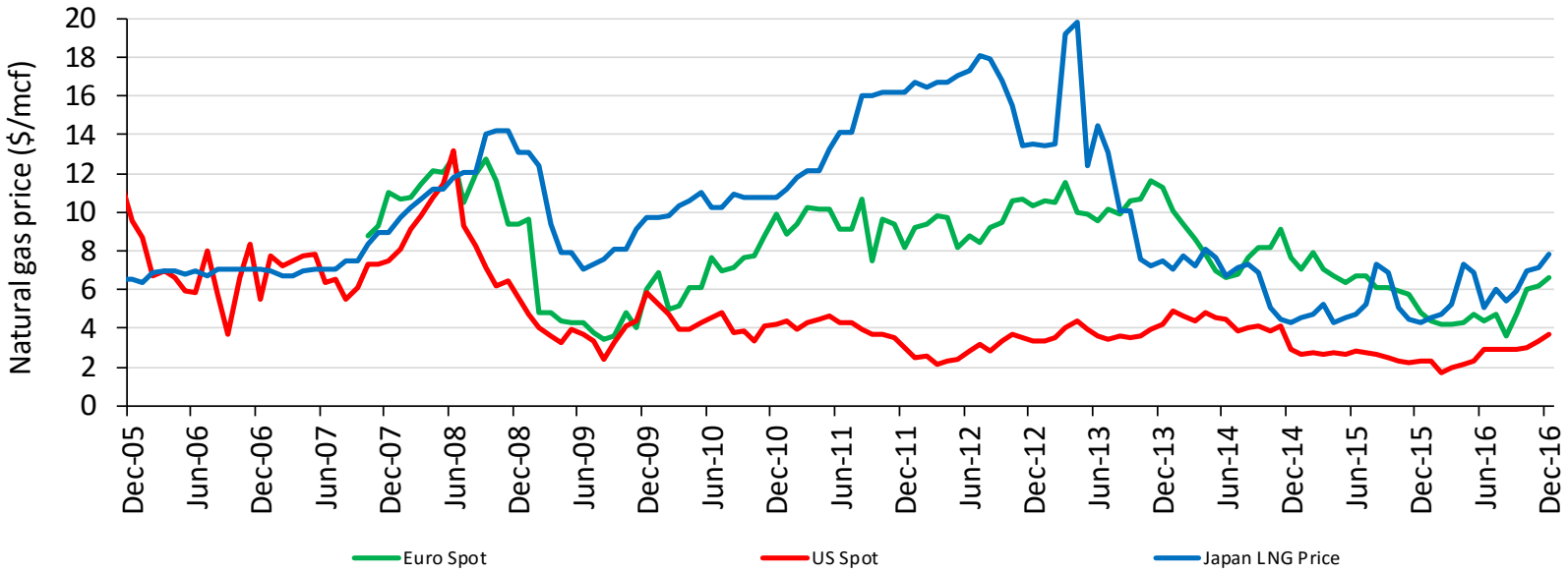


Source: Bernstein, Guinness Atkinson Asset Management, (data to Dec 2017)

Natural gas: summary views

- The gap between US and international gas prices has closed significantly
  - US continues to have high levels of new supply, economic at $3/mcf, from the Marcellus
  - Asian gas demand has weakened as Japan has increased nuclear activity and switched to solar
  - Asian gas price formulae are linked to oil prices with a 6 month lag
- New US LNG facilities will start operation between 2016 and 2020, the economics of the spot price arbitrage now look significantly less attractive

Global natural gas prices (US$/mcf)

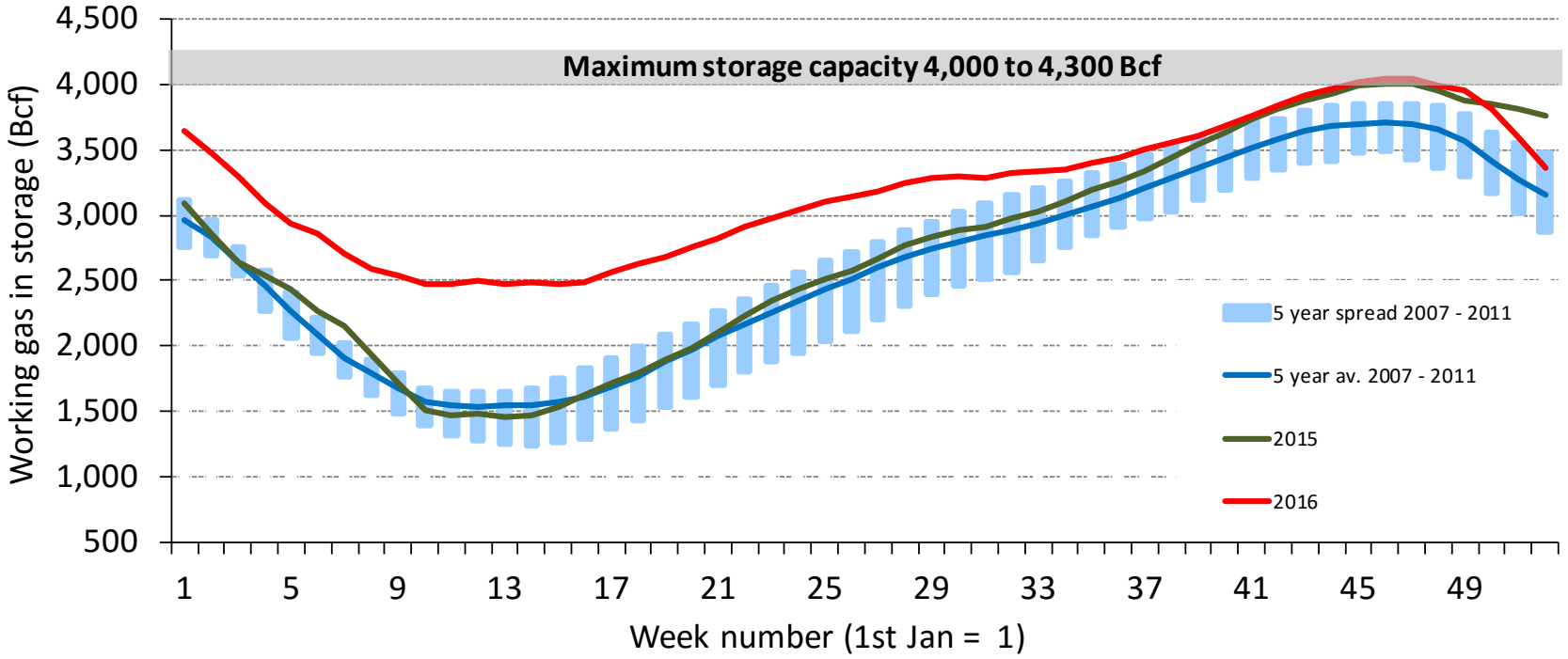


Source: Bloomberg, Guinness Funds (data as of Dec 2016)

US natural gas: storage is now back into the 5 year average range

- A very warm 2015/16 winter pushed inventories to record (seasonal) levels
- A cold start to the 2016/2017 winter have seen inventories normalise

US natural gas inventories

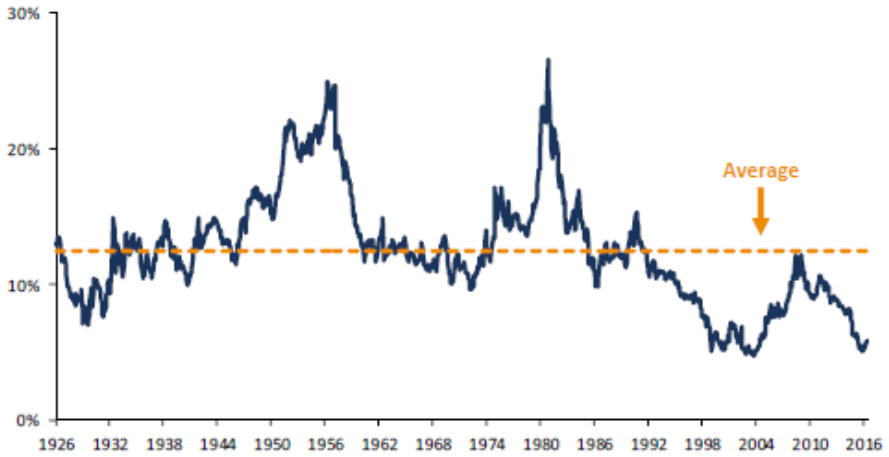


Source: IEA; Guinness Funds, (data to Dec 31 2016)

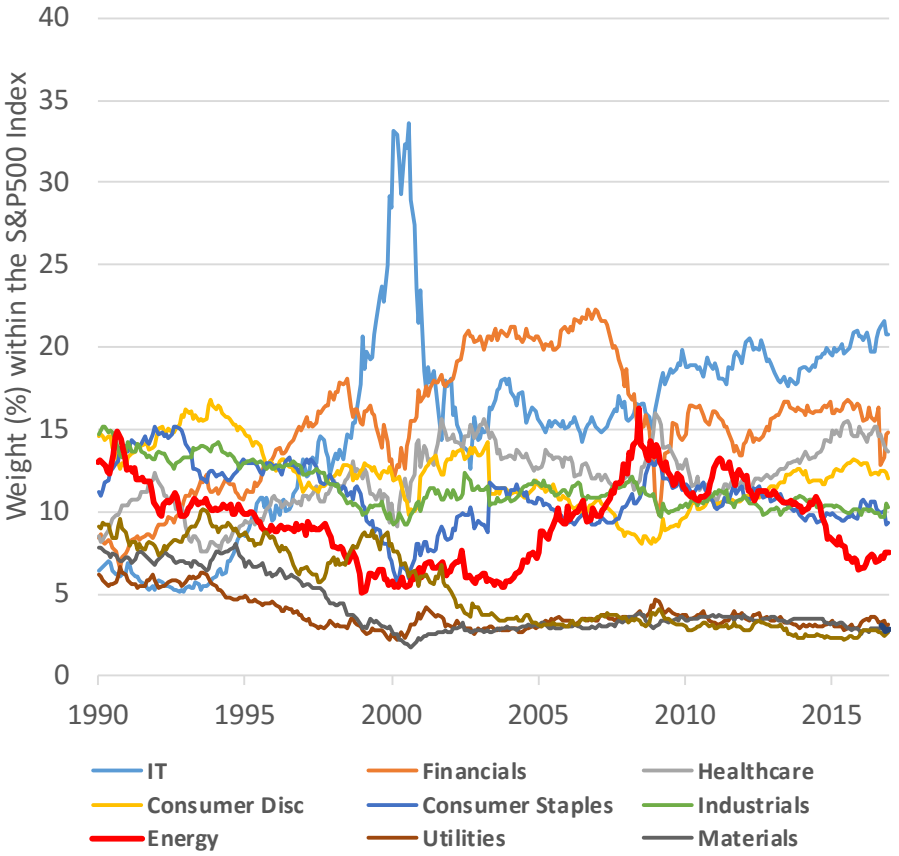
Energy equities: at low levels within global indices

- The S&P500 energy index was 7.6% of the S&P500 index at 31 Dec 2016
- Since 1990, energy has ranged between 5.1% and 16.2% of the S&P500
- The average weight over the last 25 years has been 9.5%
- The weight of energy within the S&P 500 is close to multi-decade lows

Weight of energy with the S&P Index (1926-2016)



S&P Index sector weights (1990-2016)

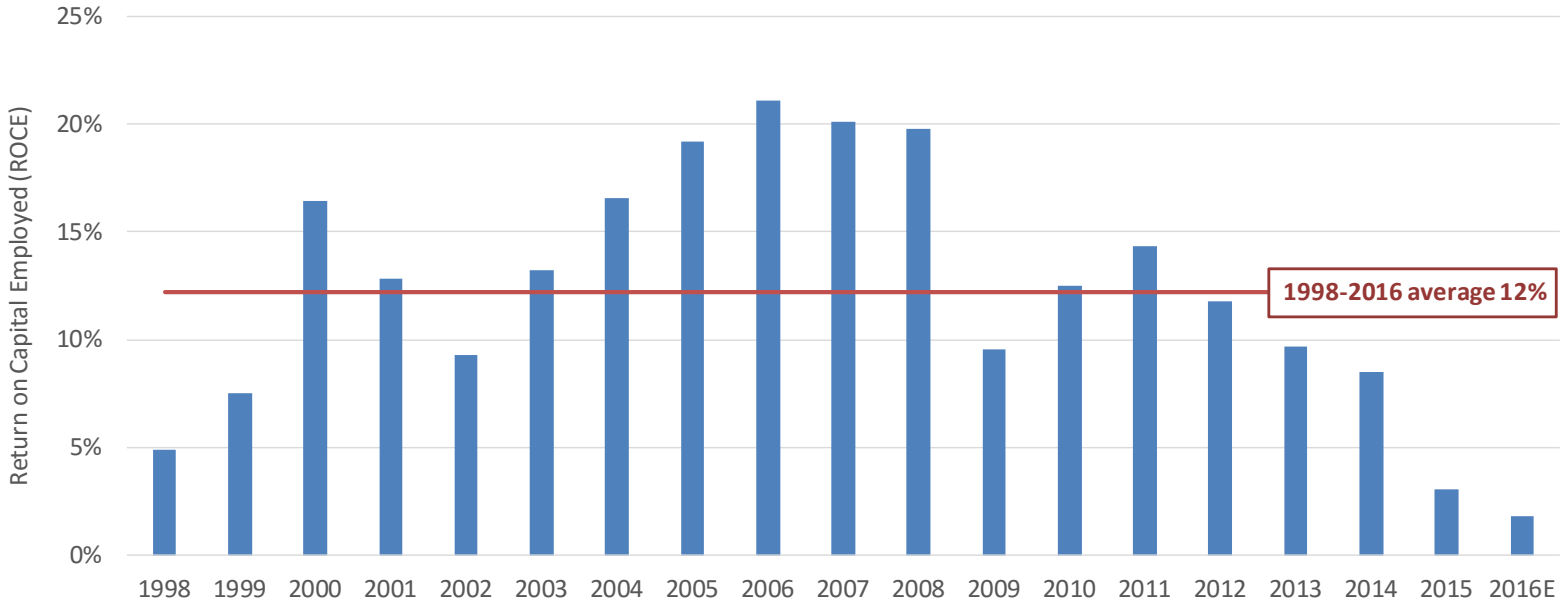


Source: GMO, S&P, MSCI, Bloomberg, Guinness Atkinson Asset Management (data to Dec 31 2016)

Guinness Atkinson Energy Fund: at a trough level of ROCE

- The combination of lower oil prices and legacy higher cost structures leave ROCE depressed
- The ROCE of the Guinness Atkinson Global Energy portfolio is currently only 2% at $45 oil in 2016
- The long run average of the same portfolio of holdings would have been 12%
- We expect reported ROCE to improve as a result of
  - External factors: improvements in oil and natural gas prices
  - Internal factors: Cost deflation, efficiency improvements and M&A activity

ROCE of current Guinness Atkinson Energy fund portfolio holdings



Source: Bloomberg, Company Data and includes analysis of all 'full position' holdings in the Guinness Atkinson Global Energy fund as of December 31 2016. *Past performance is no guarantee of future results.*

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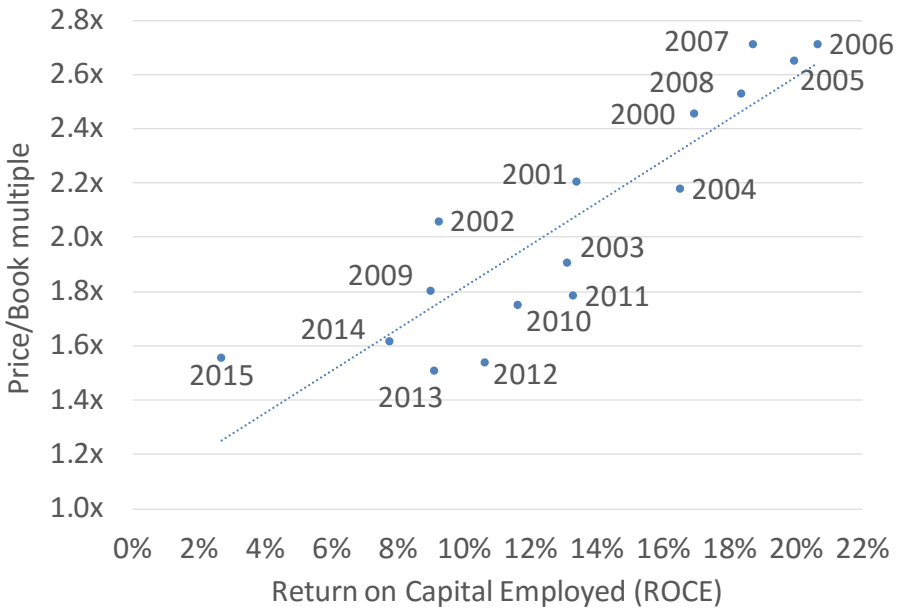
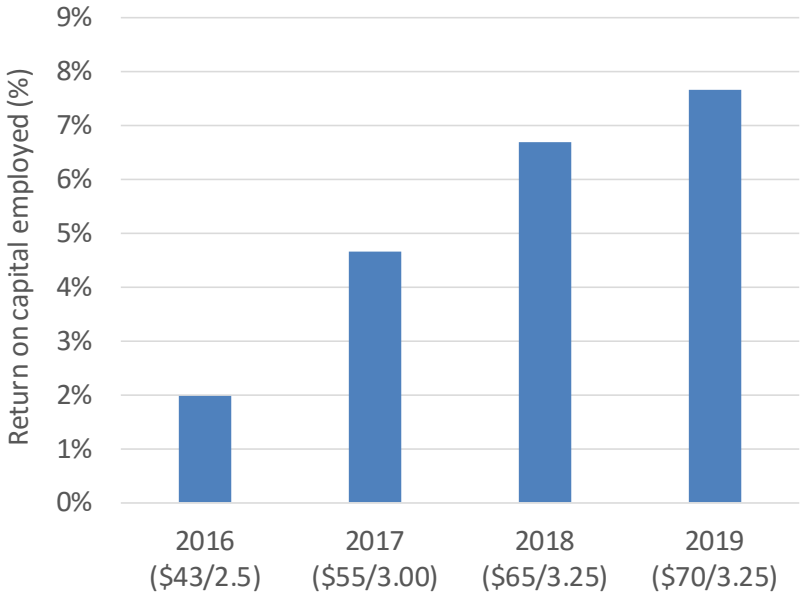
Guinness Atkinson Energy Fund: ROCE trends are important

- We believe return on Capital Employed (ROCE) is a key driver of valuation for the energy sector
- ROCE has been depressed as a result of cost inflation, capital enlargement and now, oil prices
- The ROCE for the Guinness Atkinson portfolio is likely to be only 2% in 2016 at $43 Brent oil
- Even with $70/bl oil in 2019, all else being equal, ROCE would be below the long run average of 12%
- The sector is focussing on cost cutting and efficiency gains to help boost ROCE
- We see good potential for ROCE to exceed our expectations and for valuation to benefit

ROCE vs P/B multiple for Guinness Atkinson Energy portfolio



ROCE for the Guinness Atkisnon Energy portfolio



Source: Bloomberg numbers in brackets indicate forecast Brent oil ($/bl) and Henry Hub ($/mcf) gas prices; upside for GA Energy portfolio upside represent Guinness Atkinson estimates

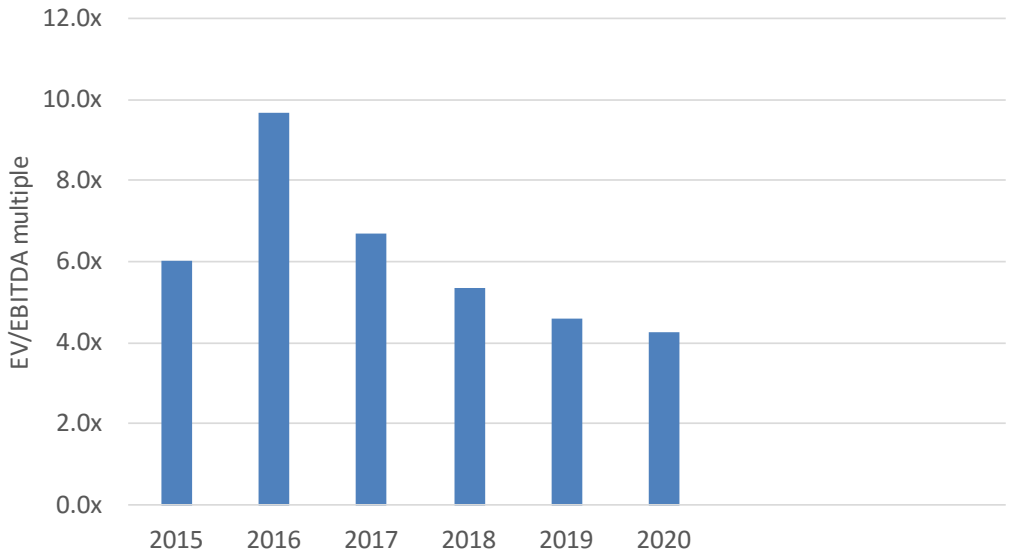
Past performance is no guarantee of future results.

GUINNESS ATKINSON FUNDS

Guinness Atkinson Energy Fund: sources of potential equity upside

- We use target EV/EBITDA multiples as one of our tools for assessing energy equity valuation
- Each company has a specific target multiple based on historic levels and profitability
- The Guinness Atkinson portfolio has had a 10yr average (2006-15) EV/EBITDA multiple of around 7.8x
- Our average target multiple is a more conservative 6.5x for the Guinness Atkinson Energy portfolio
- We see room for further improvements in valuation if:
  - The energy industry improves ROCE above our expectations
  - The market ascribes a greater than 6.5x EV/EBITDA multiple to our energy equities

Historic and forecast * EV/EBITDA multiples (at $65 oil)



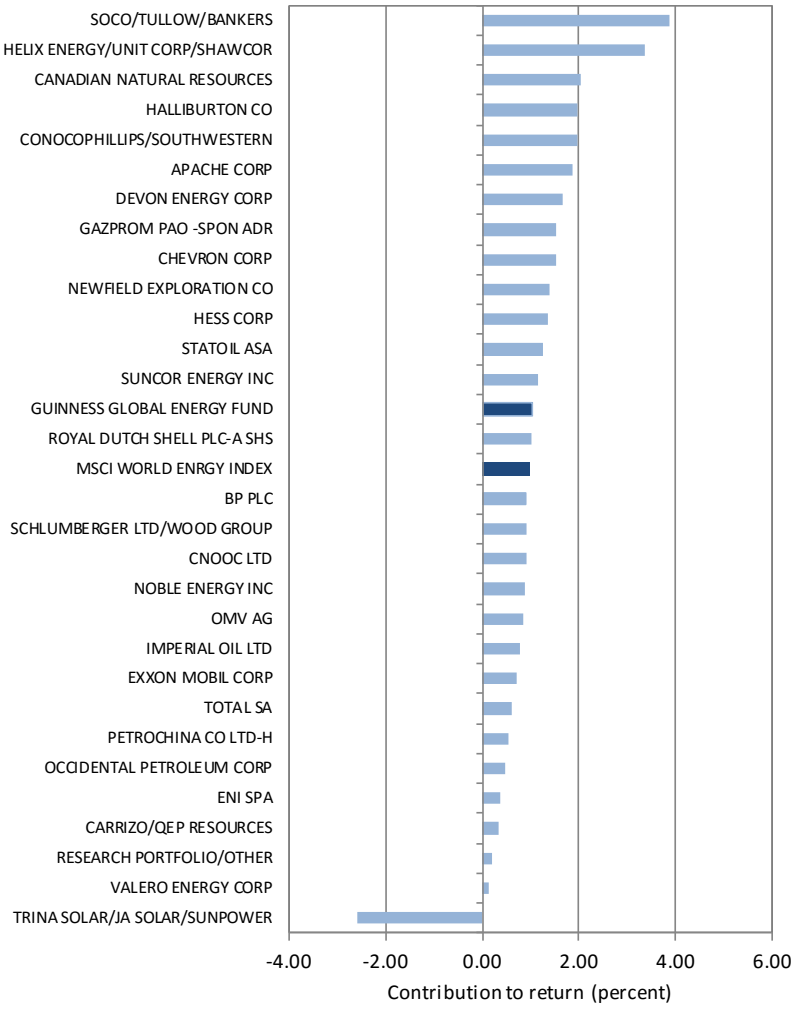
Source: Bloomberg, Guinness Atkinson Asset Management estimates

* Oil and gas price estimates as follows: 2016 ($43/$2.50), 2017 ($55/$3.00), 2018 ($65/$3.25), 2019 ($70/$3.25)

GUINNESS ATKINSON FUNDS

Indicative fund contribution, per position

2016 indicative contribution



Notes: MSCI World Energy Index included for comparison purposes. Charts include companies held in the quarter but, in some instances, no longer held. There is no guarantee similar investments will be made

Source: Guinness Atkinson, Bloomberg, data as of end Dec 2016

Fund positioning: key themes in the fund for 2017

Theme	Example holdings	Weighting (%)
Cheap large-cap oil	Apache, Suncor Energy, Canadian Natural	34.4%
Undervalued integrated oil & gas reserves	Shell, OMV, Total	21.9%
Exploration & production spending plans	Helix, Schlumberger, Halliburton	10.7%
US shale oil growth	Newfield, QEP Resources, Carrizo	7.9%
Emerging market natural gas demand	PetroChina, Gazprom	7.6%
International mid and small cap oil producers	enQuest, Soco International, Nexen	6.9%
US Gulf Coast refining advantages	Valero	3.7%
Rising US natural gas price	Devon	3.3%
Other (incl cash)	JA Solar, Unit Corporation, SunPower	3.6%
		100.0%

Top 10 holdings as of 12/31/2016: 1. OMV AV 3.94% 2. Statoil ASA 3.81% 3. Suncor Energy Inc 3.79% 4.Royal Dutch Shell PLC 3.76% 5.Hess Corporation 3.75% 6.Imperial Oil Ltd 3.65% 7. Devon Energy Corp 3.63% 8. Valero Energy Corp 3.62% 9. Apache Corp 3.61% 10. Petrochina Co Ltd 3.59%

Source: Guinness Atkinson, at end Dec 2016

Fund and index performance, as of Dec 31, 2016

- Outperformance from energy vs S&P500 in 2016, but, in our analysis, the rebound still leaves the sector a long way from historical normalised valuation levels

	2016	1 Year	5 Years*	10 Years*	Since Inception (June 30, 2004)*
Global Energy Fund	27.04%	27.04%	-0.79%	1.16%	7.48%
MSCI World Energy Index	27.63%	27.63%	1.54%	2.42%	6.82%
S&P 500	11.95%	11.95%	14.62%	6.93%	7.76%

Gross expense ratio: 1.41%

*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

Source: Bloomberg

Fund characteristics

Single sector	Companies engaged in the production and distribution of energy (oil, natural gas, coal, alternative energy, nuclear and utilities)
High conviction	Equally weighted, concentrated portfolio (30 positions)
Unconstrained	No reference to index
Global	Diversified globally
Investment type	Listed equities (long-only)
Investment objective	Long-term capital appreciation

Fund manager biographies

Timothy Guinness

- Executive Chairman and Chief Investment Officer of Guinness Asset Management
- Portfolio manager of the Investec Global Energy Fund from November 1998 to February 2008
- Co-founder of Guinness Flight Global Asset Management and, after its acquisition by Investec, chairman of Investec Asset Management until March 2003
- Graduated from Cambridge University in 1968 with a degree in Engineering. After obtaining an MBA at MIT, worked for 10 years as a corporate financier

Will Riley CA

- Joined Guinness Asset Management in 2007
- Company valuation expert for PricewaterhouseCoopers 2000-2007
- Qualified as a Chartered Accountant in 2003
- Graduated from Cambridge University with a Masters degree in Geography in 1999

Jonathan Waghorn

- Joined Guinness Asset Management in 2013
- Co-portfolio manager of the Investec Global Energy Fund from February 2008 to May 2012
- Co-head of energy equity research at Goldman Sachs from 2000-2008
- Drilling engineer in Dutch North Sea for Shell

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Guinness Atkinson Asset Management

- **Guinness Atkinson Asset Management**: founded in 2003, along with US sister firm Guinness Atkinson Asset Management Inc.
- **Four core areas of expertise:** Global Equities, Energy, Asia & Financials
- **Guinness Group AUM (at Dec 31, 2016): $1.2bn**
- **Staff of 19, including 8 investment professionals**
- **Company is 100% owned by employees**

AUM = assets under management

Disclosure

Opinions expressed are subject to change, are not guarantee and should not be considered investment advice.

The Fund's holdings, industry sector weightings and geographic weightings may change at any time due to on-going 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. References to other mutual funds should not be interpreted as an offer of these securities.

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.

While the fund is no-load, management and other expenses still apply. Please refer to the prospectus for further details.

This information is authorized for use when preceded or accompanied by a prospectus for the Guinness Atkinson Funds. The prospectus contains more complete information including investment objectives, risks, fees and expenses related to an ongoing investment in the Fund. Please read it carefully before investing.

You cannot invest directly in an index.

Contango refers to a situation where the future spot price is below the current price, and people are willing to pay more for a commodity at some point in the future than the actual expected price of the commodity.

Fund holdings & sector allocations are subject to change and are not recommendations to buy or sell any security.

Diversification does not assure a profit nor protect against a loss in a declining market.

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