



**GUINNESS  
ATKINSON**  
F U N D S

# Energy brief



Tim Guinness

July 2013

Commentary and Review by portfolio manager  
Tim Guinness



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## REPORT HIGHLIGHTS

### FUND NEWS

• Fund size \$71 million at end of June

### OIL

• **WTI & Brent rise; Spread narrows to \$6**

WTI rose from \$92 to \$97 in June. Brent increased by \$2, ending at \$102. WTI-Brent spread narrowed to \$6.

### NATURAL GAS

• **US gas price falls to \$3.56**

Henry Hub spot traded down 47 cents (c) to end June at \$3.56 (still well up from April 2012 low of \$1.84). Gas in storage at the end of June was 2% under the 5 year average.

### EQUITIES

• **Energy lags broad equities slightly in June**

The MSCI World Energy Index underperformed the S&P 500 Index by 0.8% (all in US dollar terms).

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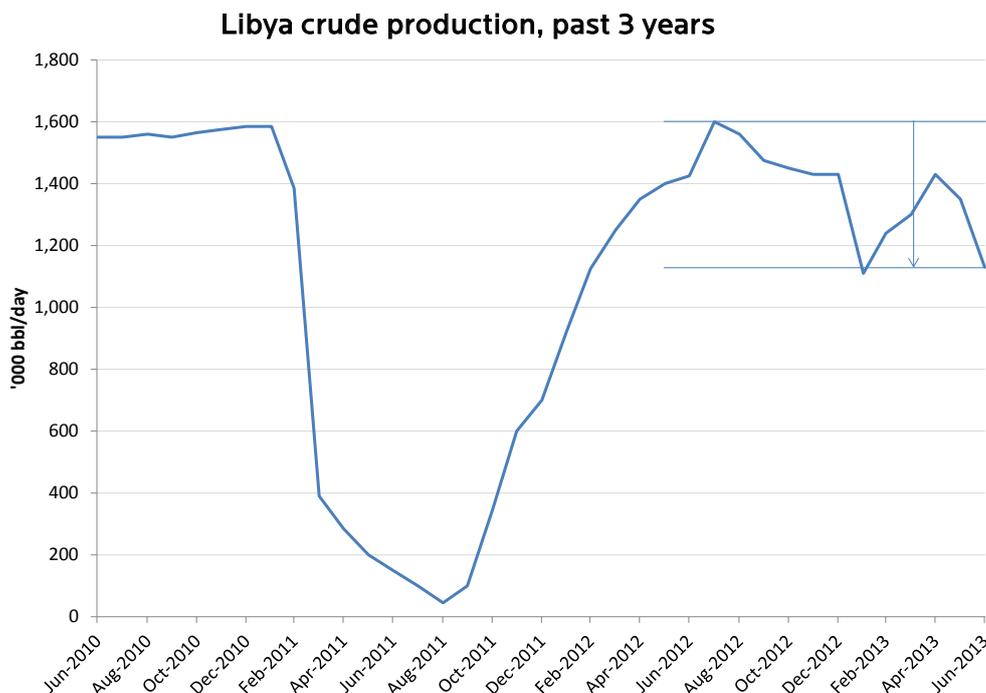
- ➔ June in Review
- ➔ Manager's Comments
- ➔ Performance: Guinness Atkinson Global Energy Fund
- ➔ Portfolio: Guinness Atkinson Global Energy Fund
- ➔ Outlook
- ➔ Appendix: Oil and Gas Markets, Historical Context

**Chart of the Month:**

**Libya oil production down almost one third since 2012**

Despite recovering briefly in 2012, to the level seen before the war, Libyan production has fallen by 0.47 million barrels per day (m b/day) (29%) over the past 11 months. While the fall in production, caused by the civil war, in 2011 was greater –at one point output fell to almost zero – this recent ‘supply shock’ has put significant upward pressure on Brent.

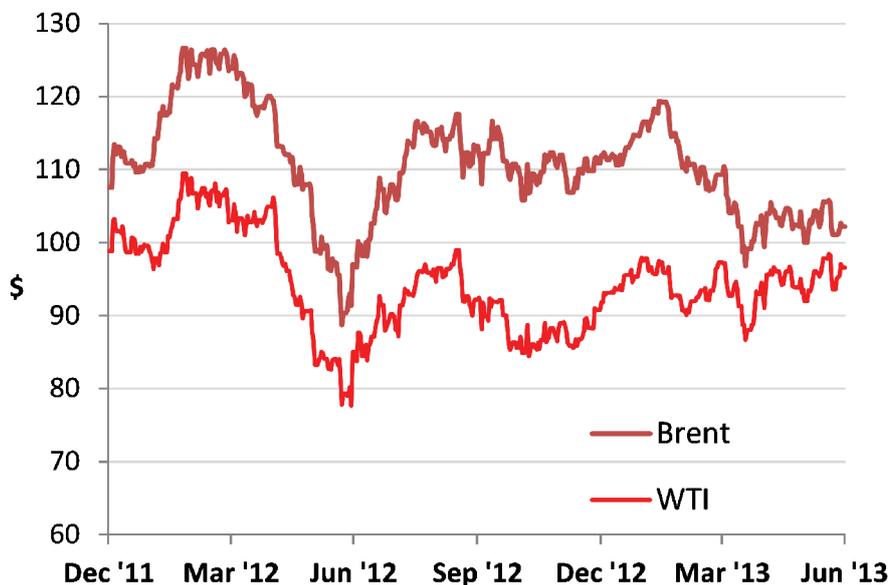
Rising civil unrest caused by labor disputes has led to shut-ins at major onshore oil fields and production facilities, and problems have been compounded by unreliable power supplies to infrastructure. Efforts by security forces in the country have only been hampered by violence from tribal militias, and it is unclear when the situation will be resolved.



Source: Bloomberg, Guinness Atkinson Asset Management (June 2013)

**1. June 2013 Review****Oil market**

Figure 1: Oil price (WTI and Brent \$/barrel) 18 months December 31, 2011 to June 30, 2013



Source: Bloomberg

The West Texas Intermediate (WTI) oil price opened June at \$91.97. The price rose over the month to reach a high on June 18 of \$98.44, before declining to close the month at \$96.56. So far this year, WTI has averaged \$94.20. WTI averaged \$94.12 in 2012 and \$95.04 in 2011.

Brent also rose slightly in June, increasing from \$100.03 to \$102.16. The gap between the WTI and Brent benchmark oil prices, which started at the beginning of 2011, narrowed to around \$6. The spread, caused by high stock levels resulting from increased US onshore production, has narrowed considerably over the past 4 months following pipeline capacity expansions in numerous oil producing basins.

**Factors which strengthened the WTI and Brent oil prices in June:**

- **Falling Libyan output**

Production in Libya fell in June by 0.22m b/day to 1.13m b/day, due to growing unrest in the country. With Organization for Economic Cooperation and Development (OECD) inventory levels looking fairly tight (see below), supply shocks, such as this, could place additional demands on Organization of Petroleum Exporting Countries (OPEC), and in particular Saudi, to increase production. Despite Saudi's official level of spare capacity being around 3m b/day, actual spare capacity could be considerably lower. Furthermore, market watchers are expecting Saudi production to increase over the summer months to satisfy domestic electricity demand. Given this potential lack of spare capacity, and the relatively tight global market, further supply shocks could put significant upward pressure on the price of crude.

- **Rising non-commercial futures position**

The New York Mercantile Exchange (NYMEX) net non-commercial crude oil futures open position rose again in June from 257,000 to 275,000 contracts long. We regard a net long position over 200,000 contracts to be relatively high.

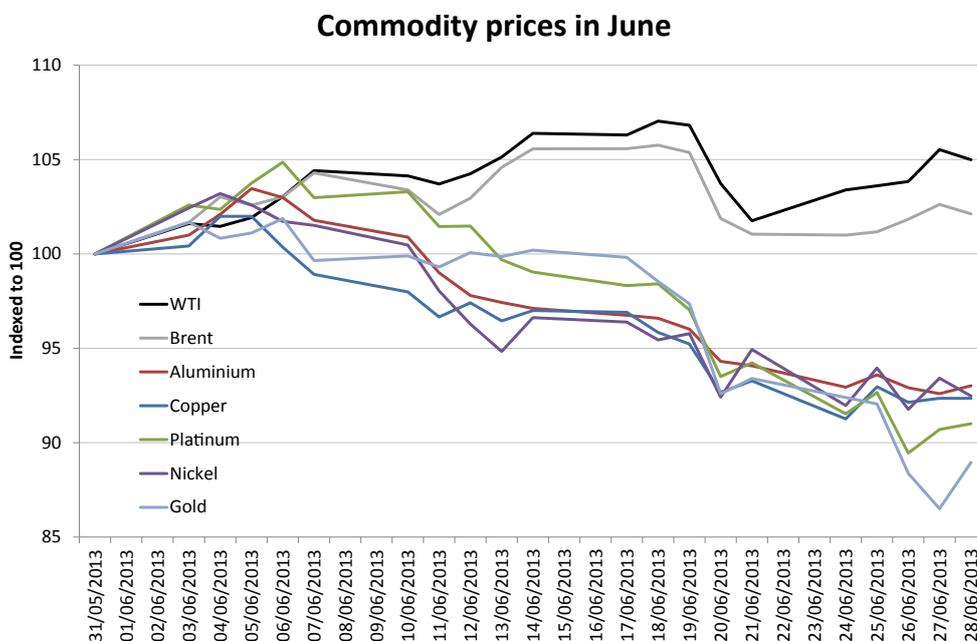
- **Low Iranian production**

Continuing US and European sanctions have led to falling output from Iran, with production reaching a low of 2.5m b/day in May, according to Bloomberg figures. Production for June rose slightly to 2.56m b/day. Some market commentators have indicated that Iran is storing oil in floating offshore tankers, however, estimates of the total amount in storage are about 25-28m barrels representing less than a month's production. These figures all suggest that the sanctions are having an effect, and output is being severely restricted.

**Factors which strengthened the WTI oil price in June:**

- **Commodities sell off**

Comments made by the Chairman of the Federal Reserve Ben Bernanke, that the Fed would start to reduce quantitative easing measures, spooked markets. Furthermore, fears about the Chinese banking system led to a large sell-off in the commodities market in June. Despite the negative market sentiment, oil prices held up relatively well as the following chart shows:



Source: Bloomberg

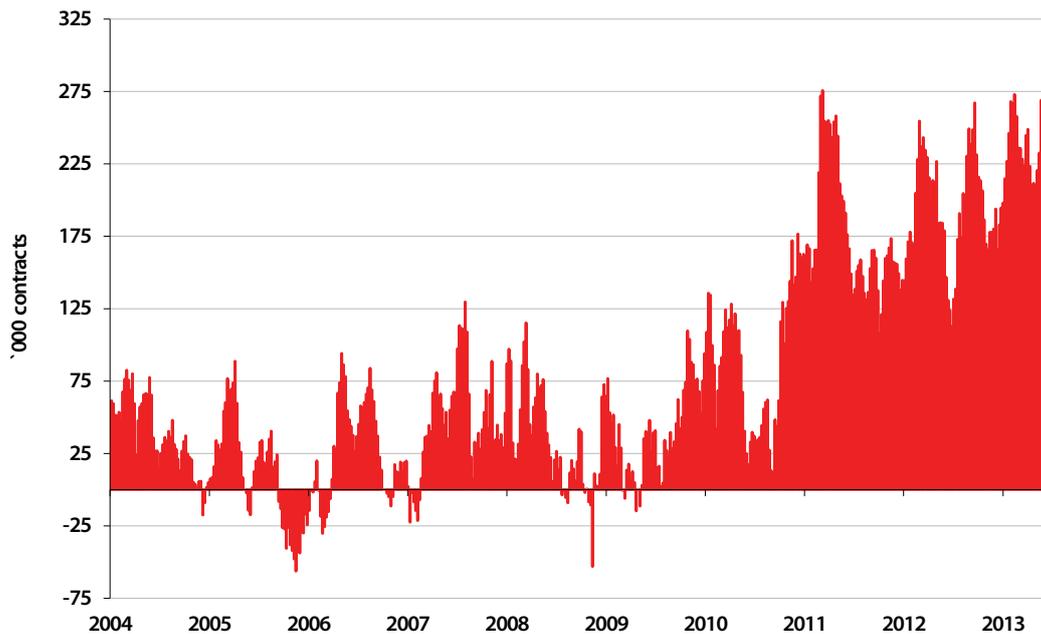
- **US crude and product stocks high**

Total stocks of US crude and refined products fell slightly in June to 728m barrels – a level 4% higher than the 5 year average (702m barrels). Elevated stocks in the US are indicative of recent increases in US onshore production. While noteworthy, this observation must be viewed in the context of total OECD inventories (a better proxy for overall global oil balance) which remain well behaved.

**Speculative and investment flows**

The New York Mercantile Exchange (NYMEX) net non-commercial crude oil futures open position rose in again in June. It started the month at 257,000 contracts long, increased to a high of 299,000 contracts before ending the month at 275,000 contracts. We regard a net long position over 200,000 contracts to be relatively high.

Figure 2: NYMEX Non-commercial net futures contracts: WTI January 2004 – June 2013



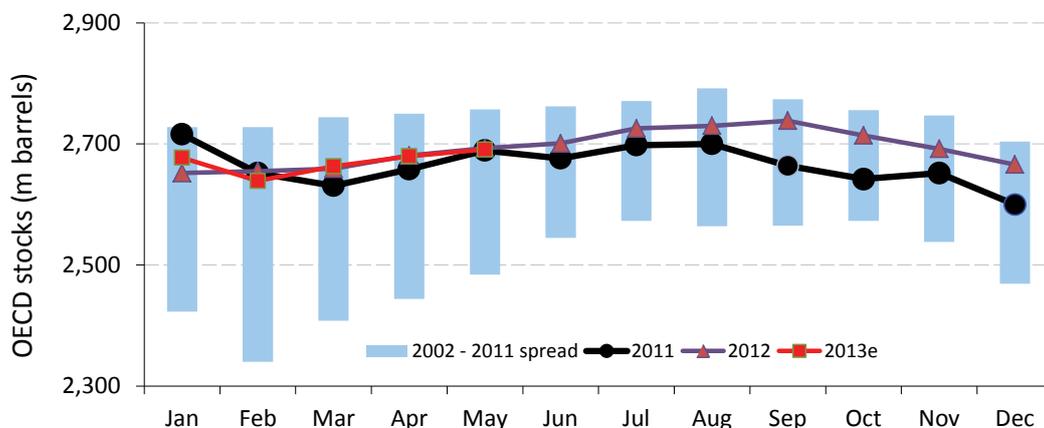
Source: Bloomberg/Nymex (June 2013)

**OECD stocks**

OECD estimated total crude and product stocks for May 2013 (published in the June 2013 International Energy Agency (IEA) Oil Market Report) grew by 11 million barrels from 2,680 million barrels, giving a total stock of 2,691 million barrels. Over the preceding five years, the average inventory build in May was 20 million barrels.

After sitting for two years above the historic levels of OECD inventories, a noticeable shift downward occurred in 2011 in absolute inventory levels versus the 1998-2009 spread, as the graph below shows. The tightening happened even as OPEC-12 production increased to make up for lost Libyan and then Iran production, and the IEA released 60 million barrels of emergency reserve oil. In 2012, inventories were generally looser than 2011, illustrating Saudi’s attempts to keep production high and bring the Brent oil price back towards \$100. So far in 2013, inventories have remained well behaved, falling in the top half of the 2002-2011 range.

Figure 3: OECD total product and crude inventories, monthly, 1998 to 2013



Source: IEA Oil Market Reports (June 2013 and older)

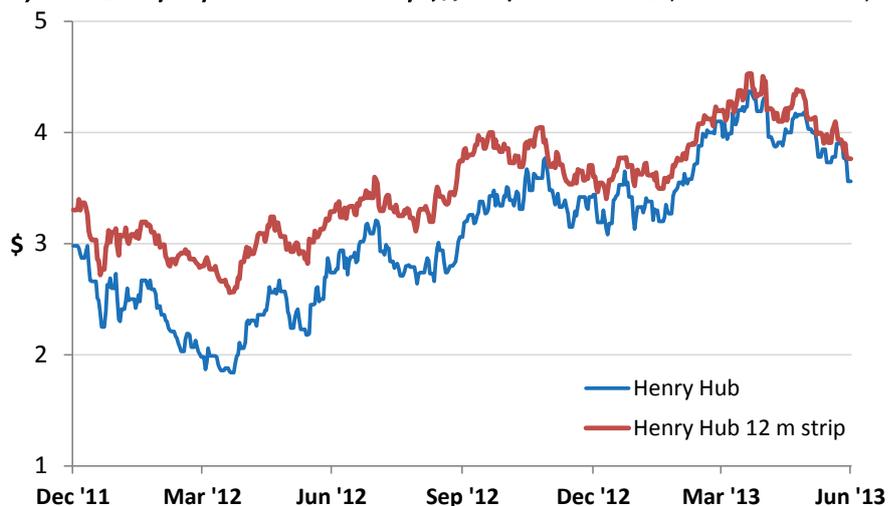
**2. Natural Gas Market**

The US spot natural gas price (Henry Hub) opened June at \$4.03 per Mcf (1000 cubic feet) and, bar a slight rally around the 20th of the month, declined steadily to close at \$3.56.

Despite the decline in June, the spot gas price has nearly doubled from a low of \$1.84 in April 2012. The price has averaged \$3.75 so far in 2013, well above the 2012 average of \$2.75 but down on the 2010 and 2011 averages of \$4.38 and \$4.00 and significantly below the average in each of the previous 5 years (2005-2009).

The 12-month gas strip price (a simple average of settlement prices for the next 12 months' futures prices) fell over the month from \$4.12 to \$3.76. The strip price has averaged \$3.96 so far this year, having averaged \$3.28 last year, \$4.35 in 2011, \$4.86 in 2010 and \$5.25 in 2009.

*Figure 4: Henry Hub Gas spot price and 12m strip (\$/Mcf) December 31, 2011 to June 30, 2013*



Source: Bloomberg

#### Factors which weakened the US gas price in June included:

- **Overall market slightly oversupplied**

Our analysis of injections of gas into storage implies that the market has shifted over the past 3 months from slight undersupply (April) to slight oversupply (May and June). We estimate the oversupply to be around 1 bcf/day. Leading edge data from Bentek suggests this has been caused by steady onshore supply and weaker utility demand as coal to gas switching unwinds.

- **US onshore production growth**

The April data (latest available) from the Energy Information Agency (EIA) indicated that total US natural gas production (Lower 48 States) was up by 0.5 billion cubic feet per day (Bcf/day) (0.8%) month-on-month. Total onshore production also rose by 0.5 Bcf/day month-on-month, implying that offshore production was flat. On a positive note, we are encouraged that total production for April 2013 remains 0.5 Bcf/day below peak production in October 2012.

- **Gas to coal switching**

With the gas spot price in June trading at around \$3.75, it is likely that some of the coal to gas switching that occurred in 2012 was reversed. At its peak in May/June 2012, we could identify around 6 Bcf/day of switching. This implied that in total, coal and natural gas were fuelling the same amount electricity generation. We believe the level of switching is now down to less than 2 Bcf/day (implying that coal has regained its lead in overall electricity generation), but even this smaller amount could affect the overall balance of the gas market should it fluctuate from here.

**Factors which strengthened the US gas price in June included:**

- **Natural gas storage**

Total gas in storage at the end of June was 2% below the 5 year average, indicating that the overall market is in far better balance than 12 months ago, when gas in storage was 23% above the 5 year average.

- **Exports to Mexico**

Natural gas exports to Mexico were 1.8 Bcf/day in June and have averaged 1.7 Bcf/day since January, 21% higher than the same period in 2012. Around 60% of these exports come from pipelines out of Texas. A recent EIA report indicated that the several new pipeline projects may be completed by 2014, several out of Texas. If these are built as expected, the US's export capacity to Mexico could double to around 7 Bcf/day (c.10% of total US domestic demand).

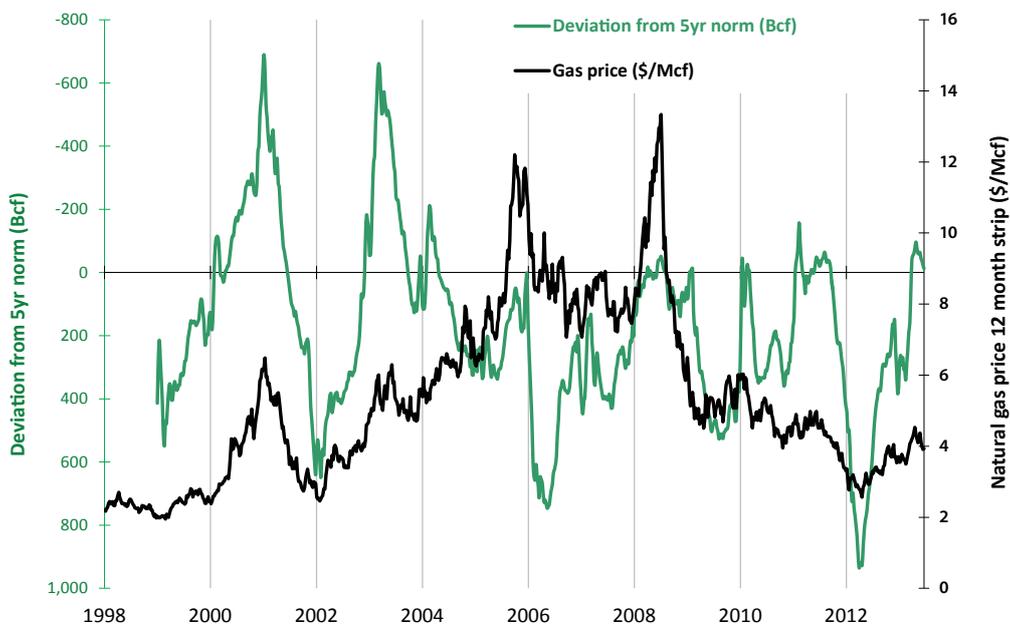
- **Low gas drilling rig count**

The US natural gas-directed rig count (reported by Baker Hughes) fell from 354 to 353 rigs during June. Over the last 18 months, the rig count has declined from 923 rigs (i.e. by 62%). The falling rig count reflects a suspension of activity in areas that are no longer economic to drill, given the depressed gas price. Of course there is a reasonable lead time between a fall in the rig count and a fall in production but the cumulative effects of the slide can only grow for as long as the rig count is low.

**Natural gas storage**

Swings in the supply/demand balance for US natural gas should, in theory, show up in movements in gas storage data. The following graph shows the 12 month gas strip price (in black) against the amount of gas in storage expressed as the deviation from the 5 year storage average (in green). Swings in storage have frequently been a leading indicator to movements in the gas strip price.

*Figure 5: Deviation from 5yr gas storage norm vs. gas price 12 month strip (H. Hub \$/Mcf)*



Source: Bloomberg, EIA (May 2013)

The surplus of gas in the second half of 2008 and 2009, a result of oversupply during the recession, can be seen in gas storage data, with the inflection point in storage occurring in July 2008 and the storage line moving from negative (i.e. deficit) to positive (i.e. surplus) territory over this 18 month period. This coincided with the gas strip price falling from a peak of over \$13 in July to below \$5. An unusually cold

2009/10 winter boosted demand and pushed the gas storage level back into balance, only for over-supply to persist again for much of the rest of 2010. A cold 2010/11 winter followed by a hot 2011 summer tightened storage again, with storage levels staying around the 5 year average for much of this period.

The very mild 2011/12 winter (in combination with rising production) caused gas storage levels to balloon to record levels, driving prices down to their lowest levels for a decade. Since then coal-to-gas switching and shut-ins and the sharp rig count drop have worked in the other direction, seeing gas prices rising from their sub \$2 lows in April 2012 to over \$4 now.

We watch movements in gas storage closely as it is likely to be a coincident indicator, weather adjusted, for the start of a sustained gas price recovery.

### 3. Manager's Comments

#### Review of portfolio performance over the first 6 months of 2013

Among the better performers over the first six months of 2012 were our international services companies, US natural gas levered exploration and production (E&P) companies and our solar exposure. In the services sector, Halliburton (+21.2%) and Helix (+11.5%) benefited from rising international offshore oil & gas activity. The US natural gas levered names, in particular Chesapeake (+22.8%), Bill Barrett (+18.9%) and Ultra Petroleum (+12.7%) enjoyed a partial recovery in the gas price, though the price weakened over the last two months of the period. Meanwhile the solar holdings in the portfolio, JA Solar (+49.2%) and Trina Solar (+28.8%) rose on the expectation that the sector is likely to return to profitability over the next 12 months, in contrast to losses made over the past two years. Other notable positive performers were Carrizo (+33.8%), which has enjoyed good drilling results in the Eagleford shale, and OMV (+31.1%), which has benefited from an improved exploration and production outlook.

As a group, emerging market and European integrated companies performed the weakest. Gazprom (-30.4%) and Petrochina (-24.9%) suffered from the general malaise affecting emerging market equities over the period, while ENI (-13.7%) was the weakest of our European large cap holdings, its performance affected in particular by its major holding in Italian services company Saipem, which reported significant profit warnings. We remain content to hold all three: in particular, we note Petrochina starting to outperform again at the very end of the period as Chinese gas reforms gather pace.

The overall performance of the energy sector in the first half of 2013 has been muted. Oil prices have remained strong in absolute terms but are down over the period. The Brent oil price started the year at \$112 and rose strongly to a high in February of \$119 before falling sharply to end June at \$102 (down by nearly 9% over the period). The unwinding of the oil price to around \$100 came as no surprise to us. We consider a fair range for Brent today to be between \$100 and \$110 which supports the wishes of OPEC while not dampening demand.

The US natural gas price was stronger, rising 4% from \$3.43 at the start of the year to \$3.57 by 30 June. The US gas market looks in much better balance now than 12 months ago, with the amount of gas in inventories close to the five year average. Drilling activity continues to be curtailed, causing onshore gas production to flatten but not yet decline. Should this happen, as we expect over the next 12 months, we anticipate the gas price strengthening further into the \$4-5 range.

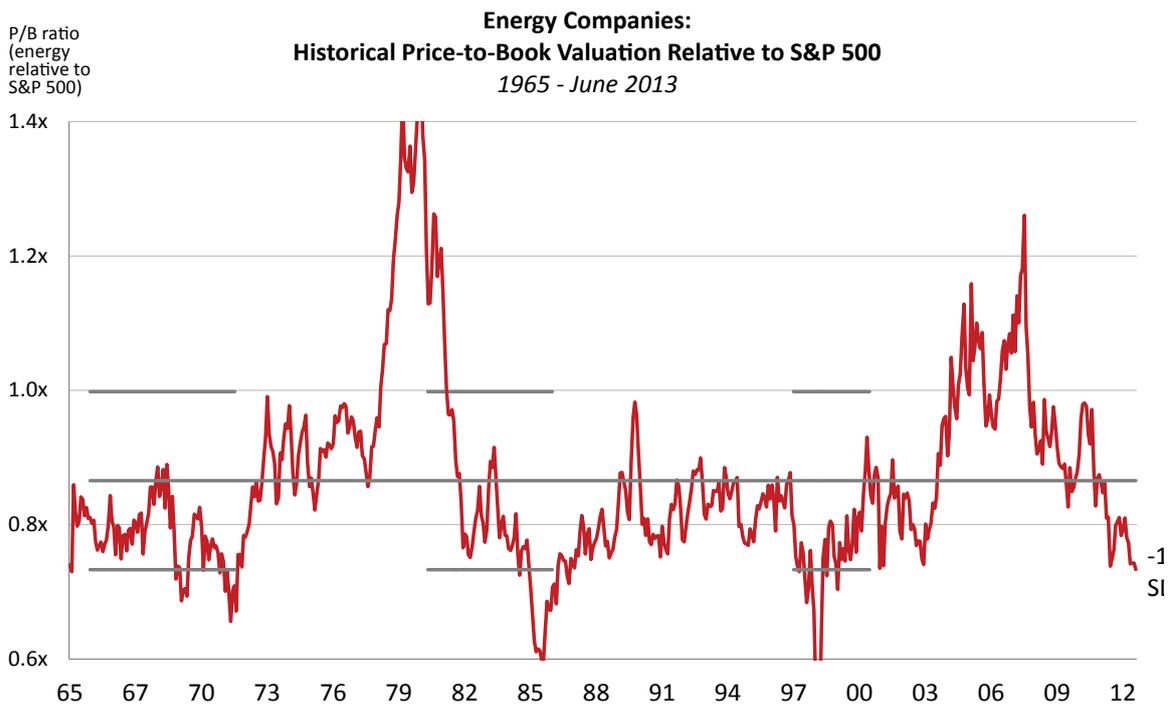
**Outlook for energy equities**

Energy equities over the past 12 months have been ahead of general natural resources but a little behind the broad equity market.

We believe that energy equities have underperformed the broad market this year because various factors are misunderstood. Principally, we think that energy equity valuations reflect an expectation that international oil prices may return in the longer term to around \$80 (driven by concerns of over-supply), something we do not expect to happen, based on the fundamentals for the commodity.

As a result, on traditional metrics of P/E ratio, Price to discounted cash flow (e.g. the SEC's PV-10 calculation) or Enterprise Value to Reserves, many energy companies are at historically low levels. The 2013 P/E ratio of our Fund at June 30 is 10.5x versus 14.7x for the S&P500.

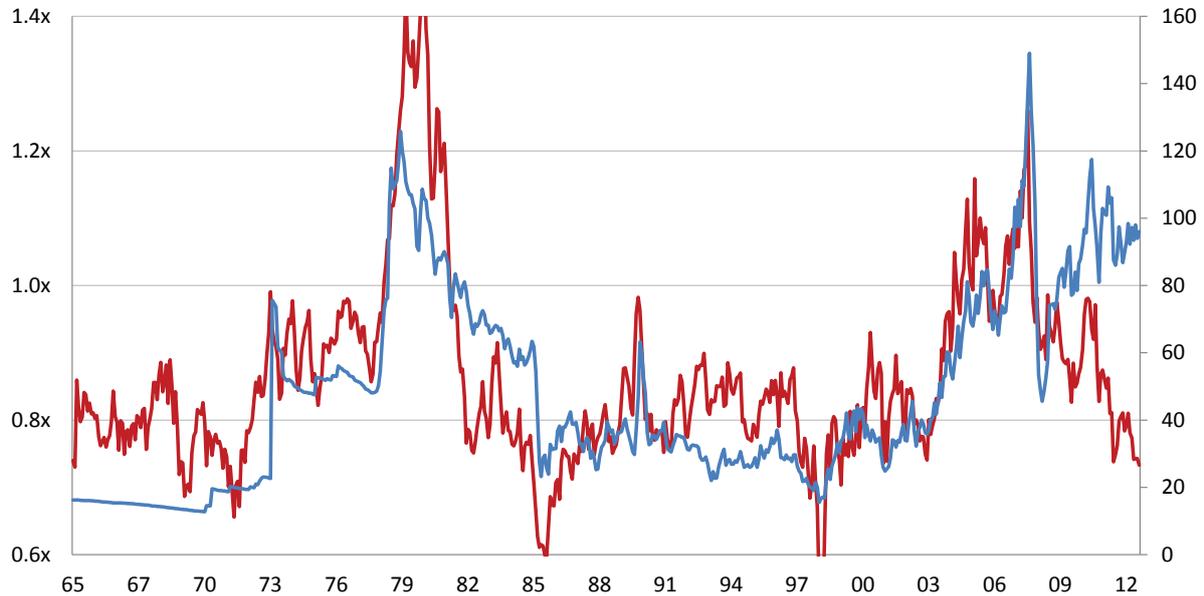
Considering valuations another way, the graph below shows the price to book ratio of the energy sector relative to the S&P 500 since 1965. The ratio today is low and looks very attractive versus history:



A comparison of the P/B ratio for energy relative to the S&P 500 with the oil price (in today's \$) is even more revealing. The only periods when the ratio has been lower than today (1970; 1986; 1998) coincided with the oil price at extreme lows. This dislocation (directionally) over the last 24 months between the oil price and energy valuations is striking:

P/B ratio  
(energy  
relative to  
S&P 500)

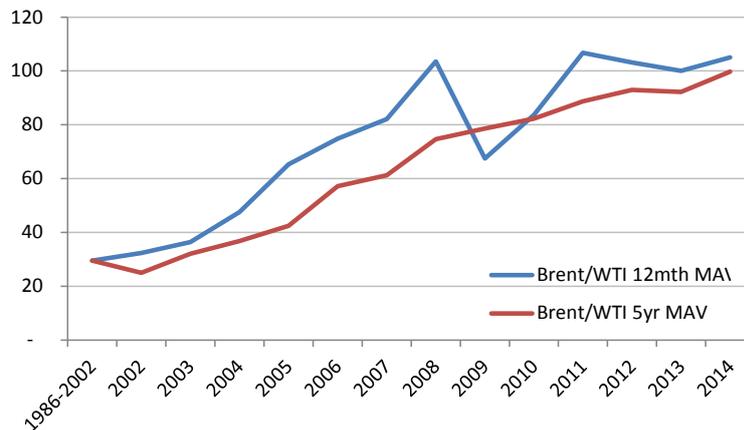
Energy Companies: Historical Price-to-Book Valuation Relative to S&P 500; Oil price (\$/bbl real)  
1965 - June 2013



Source: Bernstein; Guinness Atkinson Asset Management

We expect the dislocation to correct when the current oil price and long-run market expectations come together. \$100 oil is around where that could happen.

Oil price – last decade (inflation adjusted)



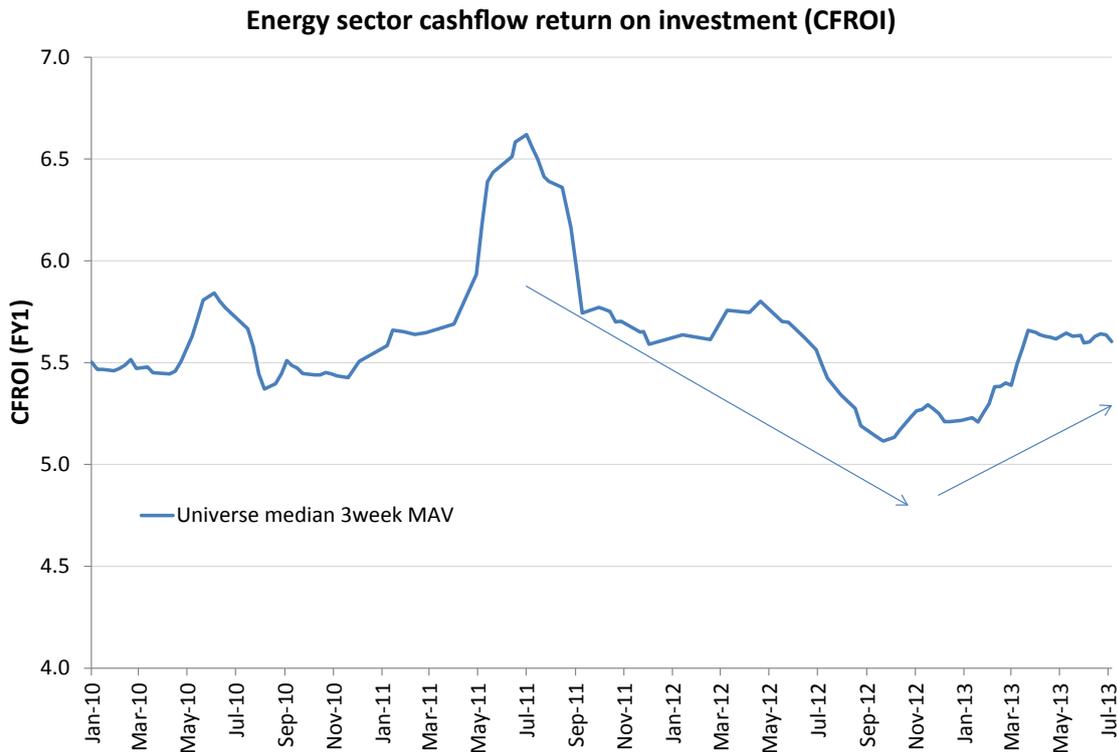
Oil Price (inflation adjusted)													Forecast	
12 month MAV	1986-2002	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
WTI	30	33	38	49	66	75	82	104	68	84	99	94	95	100
Brent	30	32	35	46	64	75	82	103	67	84	115	112	105	110
Brent/WTI 12mth MAV	<b>30</b>	<b>32</b>	<b>36</b>	<b>48</b>	<b>65</b>	<b>75</b>	<b>82</b>	<b>103</b>	<b>67</b>	<b>84</b>	<b>107</b>	<b>103</b>	<b>100</b>	<b>105</b>
Brent/WTI 5yr MAV *	30	25	32	37	42	57	61	75	79	82	89	93	92	100

Source: Bloomberg (actuals); Guinness Atkinson Asset Management (forecasts)

\*MAV = moving average

**Energy equity valuation sentiment**

For considering a good entry point at which to buy energy equities the following may be helpful. Two of the energy sector specific headwinds over the last 24 months have been the pull back in oil price from the highs reached at the time of the Libyan crisis and more recently as embargoes were placed on Iranian exports; and the weakness in the US natural gas price which troughed a year ago. Earnings estimates (and cashflow return on investment) for energy companies as a result were generally trending down from mid-2011 to late 2012. A good entry point may well be when earnings estimates stop falling. We have been looking at this for several months and as the graph below indicates the most recent move is a trend higher. We hope that energy equities will follow.



Source: CSFB HOLT; Guinness Atkinson Asset Management

All this, of course, assumes the oil price stabilizes around the five year moving average price of \$100 (blended Brent/WTI) and the gas price in due course recovers, which is what we believe is increasingly likely to occur.

Energy equities also remain one of the better inflation hedges. If we see dollar inflation of 30/50% over the next decade it will be surprising if oil and gas prices do not rise by a comparable percentage.

#### 4. Performance – Guinness Atkinson Global Energy Fund

The main index of oil and gas equities, the MSCI World Energy Index, was down by 3.39% in June. The S&P 500 was down by 2.42% over the same period. The Fund was down by 3.63% over this period, underperforming the MSCI World Energy Index by 0.24% (all in US dollar terms).

Within the Fund, June's stronger performers were Carrizo, Noble, Apache, Trina and Canadian Natural Resources. Poorer performers were Valero, Gazprom, Bill Barrett, Ultra and ENI.

##### Performance as of June 30, 2013

Inception date 6/30/04	Full Year 2009	Full Year 2010	Full Year 2011	Full Year 2012	1 year (annualized)	Last 2 years (annualized)	Last 5 years (annualized)	Since Inception (annualized)
Global Energy Fund	63.27%	16.63%	-13.16%	3.45%	12.61%	-8.01%	-5.24%	11.80%
MSCI World Energy Index	26.98%	12.73%	0.71%	2.54%	10.45%	-0.80%	-2.75%	9.41%
S&P 500 Index	26.47%	15.06%	2.09%	15.99%	20.75%	12.83%	7.05%	6.14%

Source: Bloomberg

Gross expense ratio: 1.35%

*Performance data quoted represent past performance and 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. For most recent month-end and quarter-end performance, visit [www.gafunds.com](http://www.gafunds.com) or call (800) 915-6566.*

*The Fund imposes a 2% redemption fee on shares held for less than 30 days. Performance data does not reflect the redemption fee and, if deducted, the fee would reduce the performance noted.*

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## 5. Portfolio – Guinness Atkinson Global Energy Fund

### Buys/Sells

In June, we sold our half positions in Afren and Petrominerales. Afren has been a good performer since we upgraded it from a research position in late 2010 and we felt the time had come to take profits. Petro-minerales has been a disappointment, with poor drilling results over the past 12 months. The prospects for the company have become too unpredictable for us to maintain it in the portfolio.

We switched those funds into a position in Shawcor, a Canadian energy services company with specialism in oil and gas pipe coating materials. The company has a dominant position globally in various coating and related sectors, including the provision of corrosion protection, insulation, weighting and flow efficiency for pipes, as well as inspection and joint protection. We are attracted by a number of opportunities for growth that the company has, particularly as the number of deepwater and liquified natural gas (LNG) projects expands. With a high free cashflow yield, we also see Shawcor as attractively priced today.

### Sector Breakdown

The following table shows the asset allocation of the Fund at **June 30, 2013**.

(%)	31 Dec 2007	31 Dec 2008	31 Dec 2009	31 Dec 2010	31 Dec 2011	31 Dec 2012	31 May 2013	Change YTD
<b>Oil &amp; Gas</b>	<b>103.5</b>	<b>96.4</b>	<b>96.1</b>	<b>93.2</b>	<b>98.5</b>	<b>98.6</b>	<b>96.1</b>	<b>-2.5</b>
Integrated	66.2	53.7	47.2	41.2	39.6	39.1	37.6	-1.5
Exploration and production	25.8	28.7	32.0	36.9	41.5	41.6	41.0	-0.6
Drilling	8.1	5.2	8.4	6.3	6.0	7.4	7.5	0.1
Equipment and services	3.4	6.4	5.4	5.3	6.6	7.1	6.7	-0.4
Refining and marketing	0.0	2.4	3.1	3.5	4.8	3.4	3.3	-0.1
<b>Coal and consumables</b>	<b>2.5</b>	<b>2.3</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
<b>Solar</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>3.2</b>	<b>1.2</b>	<b>1.2</b>	<b>2.3</b>	<b>1.1</b>
<b>Construction and engineering</b>	<b>0.0</b>	<b>0.4</b>	<b>0.4</b>	<b>0.4</b>	<b>0.4</b>	<b>0.6</b>	<b>0.7</b>	<b>0.1</b>
<b>Cash</b>	<b>-6.0</b>	<b>0.9</b>	<b>3.5</b>	<b>3.2</b>	<b>-0.1</b>	<b>-0.4</b>	<b>0.9</b>	<b>1.3</b>
<b>Total</b>	<b>100.0</b>	<b>0.0</b>						

Source: Guinness Atkinson Asset Management

Basis: Global Industry Classification Standard (GICS)

### Guinness Atkinson Global Energy Fund Portfolio

The Fund at June 30, 2013 was on an average price to earnings ratio (PE) versus the S&P 500 Index at 1,606 as set out in the table. (Based on S&P 500 'operating' earnings per share estimates of \$49.5 for 2008, \$56.9 for 2009, \$83.8 for 2010, \$96.4 for 2011, \$96.8 for 2012 and \$109.2 for 2013). This is shown in the following table:

	2007	2008	2009	2010	2011	2012	2013
Fund PER	8.4	7.5	14.4	9.5	9.4	10.6	10.5
S&P 500 PER	19.5	32.4	28.2	19.2	16.7	16.6	14.7
Premium (+) / Discount (-)	-57%	-77%	-49%	-51%	-44%	-36%	-29%
Average oil price (WTI \$)	\$72.2/bbl	\$99.9/bbl	\$61.9/bbl	\$79.5/bbl	\$95/bbl	\$94/bbl	\$95/bbl

## Portfolio Holdings

Our integrated and similar stock exposure (c.39%) is comprised of a mix of mid cap, mid/large cap and large cap stocks. Our five large caps are Exxon, BP, Chevron, Royal Dutch Shell and Total. Mid/large and mid-caps are ENI, StatoilHydro, Hess and OMV. As at June 30, 2013 the median PE ratio of this group was 7.6x 2012 earnings. We have one Canadian integrated holding, Suncor, which merged in 2009 with PetroCanada. The company has significant exposure to oil sands and stands on an attractive PE of 9.6x 2012 earnings given the company's good growth prospects.

Our exploration and production holdings (c.38%) give us exposure most directly to rising oil and natural gas prices. We include in this category non-integrated oil sands companies, as this is the GICS approach. The stock here with oil sands exposure is Canadian Natural Resources. The pure E&P stocks are all largely in the US (Newfield, Devon, Chesapeake, Carrizo, Stone, Penn Virginia, Ultra, QEP and Bill Barrett) and three more (ConocoPhillips, Apache and Noble) which have significant international production. One of the key metrics behind a number of the E&P stocks held is low enterprise value / proven reserves. All of the E&P stocks held also provide exposure to North American natural gas and include two of the industry leaders (Devon and Chesapeake). In PE terms, the group divides roughly into two: (i) ConocoPhillips, Apache, Chesapeake, Devon, Newfield, Ultra and Stone all with quite low PEs (8x – 14x 2013 earnings); and (ii) Noble, Carrizo, Bill Barrett, Penn Virginia and QEP with higher PE ratios. However, all look reasonably attractive on EV/EBITDA multiples.

We have exposure to four (pure) emerging market stocks in the main portfolio, though all but one are half-positions. Two are classified as integrations by the GICS (Gazprom and PetroChina) and two as E&P companies (Dragon Oil and Soco International). Gazprom is the Russian national oil and gas company which produces approximately a quarter of the European Union gas demand and trades on 2.2x 2012 earnings. PetroChina is one of the world's largest integrated oil and gas companies and has significant growth potential and advantages as a Chinese national champion. Dragon Oil is an oil and gas E&P-focused on offshore Turkmenistan in the Caspian Sea and trades on 6.8x 2012 earnings. SOCO International is an E&P company with production in Vietnam and exploration interests across East Africa in Angola, Democratic Republic of Congo and the Republic of Congo.

We have useful exposure to oil service stocks. The stocks we own are split between those which focus their activities in North America (land drillers Patterson and Unit on 11.8x and 10.9x 2012 earnings) and those which operate in the US and internationally (Helix, Halliburton and Shawcor on 12.4x – 18.6x 2012 earnings).

Our independent refining exposure is currently in the US in Valero, the largest of the US refiners, which is currently trading at significant discount to book and replacement value. Valero has a reasonably large presence on the US Gulf Coast and is benefitting from the rise in US exports of refined products seen in recent times.

Our alternative energy exposure is currently a single unit split equally between two companies: JA Solar and Trina Solar. Both were loss making in 2012 due to sharp falls in solar prices during the year but the prospects for a return to profitability over the next 12 months are improving. Trina is a Chinese solar module manufacturer and JA Solar is a Chinese solar cell manufacturer. Some measure of their recovery potential may be indicated by their 2010 PEs of 1.8x and 0.9x respectively.



## 6. Outlook

### Oil market

The table below illustrates the difference between the growth in world oil demand and non-OPEC supply over the last 10 years, together with the IEA forecasts for 2013.

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013e
											IEA
World Demand	79.3	82.5	84.0	85.2	87.0	86.5	85.5	88.3	88.9	89.8	90.6
Non-OPEC supply (includes Angola and Ecuador for periods when each country was outside OPEC <sup>1</sup> )	49.1	50.3	50.4	51.3	50.5	49.6	51.4	52.7	52.8	53.4	54.5
Angola supply adjustment <sup>1</sup>	-0.9	-1.0	-1.2	-1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ecuador supply adjustment <sup>1</sup>	-0.4	-0.5	-0.5	-0.5	-0.5	0.0	0.0	0.0	0.0	0.0	0.0
Indonesia supply adjustment <sup>2</sup>	1.0	1.0	0.9	0.9	1.0	1.0	0.0	0.0	0.0	0.0	0.0
Non-OPEC supply (ex. Angola/Ecuador and inc. Indonesia for all periods)	48.8	49.8	49.6	50.3	51.0	50.6	51.4	52.7	52.8	53.4	54.5
OPEC NGLs	3.9	4.2	4.3	4.3	4.3	4.5	5.1	5.6	5.9	6.3	6.6
Non-OPEC supply plus OPEC NGLs (ex. Angola/Ecuador and inc. Indonesia for all periods)	52.7	54.0	53.9	54.6	55.3	55.1	56.5	58.3	58.7	59.7	61.1
Call on OPEC-12 <sup>3</sup>	26.6	28.5	30.1	30.6	31.7	31.4	29.0	30.0	30.2	30.1	29.5
Iraq supply adjustment <sup>4</sup>	-1.3	-2.0	-1.8	-1.9	-2.1	-2.4	-2.4	-2.4	-2.7	-3.0	-3.2
Call on OPEC-11 <sup>5</sup>	25.3	26.5	28.3	28.7	29.6	29.0	26.6	27.6	27.5	27.2	26.3

<sup>1</sup>Angola joined OPEC at the start of 2007, Ecuador rejoined OPEC at the end of 2007 (having previously been a member in the 1980s)

<sup>2</sup>Indonesia left OPEC as of the start of 2009

<sup>3</sup>Algeria, Angola, Ecuador, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi, U.A.E. Venezuela

<sup>4</sup>Iraq has no official quota

<sup>5</sup>Algeria, Angola, Ecuador, Iran, Kuwait, Libya, Nigeria, Qatar, Saudi, U.A.E. Venezuela

Source: 2003 - 2008: IEA oil market reports; 2009 - 13: 12 June 2013 Oil market Report

Global oil demand in 2012 was 2.8m b/day up on the previous 2007 peak. This means the combined effect of the 2007-08 oil price spike and the 2008/09 recession was quite small and has been shrugged off remarkably quickly. The IEA forecast a further 0.8m b/day rise in demand in 2013 which would take oil demand to a new all-time high of 90.6m b/day.

### OPEC

Four years ago, in order to put a floor under a plunging oil price, OPEC announced in its December 17, 2008 meeting a new quota target of 25.0m b/day with effect from January 1, 2009. This figure represented a 4.2m b/day cut from the actual OPEC-11 September 2008 production level (29.2m b/day). Since then, quotas remained unchanged until the OPEC meeting on December 13 2011, at which OPEC substituted a 30 m b/day target without specifying individual country quotas. The statement read as follows:

*“In light of ..... the demand uncertainties, the Conference decided to maintain the current production level of 30.0 mb/day, including production from Libya, now and in the future. The Conference also agreed that Member Countries would, if necessary, take steps (including voluntary downward adjustments of output) to ensure market balance and reasonable price levels. In taking this decision, Member Countries confirmed their preparedness to swiftly respond to developments that might have a detrimental impact on orderly market developments. Given the ongoing worrying economic downside risks, the Conference directed the Secretariat to continue its close monitoring of developments in supply and demand, as well as non-fundamental factors, such as macro-economic sentiment and speculative activity, keeping Member Countries abreast at all times.”*

The 30m b/day figure includes 2.7m b/day for Iraq, so in effect 25.0m b/day for OPEC-11 was moved up to 27.3m b/day. The timing of this announcement was clearly complicated by numerous issues: notably (1) a range of tricky problems in four OPEC member countries – Libya (recovery from civil war), Iran (western sanctions over nuclear weapons development), Venezuela (a change of leadership), Nigeria (tribal unrest in the delta and sectarian unrest elsewhere); (2) production problems in certain non OPEC countries that might or might not resolve themselves speedily (Yemen, Syria and Southern Sudan); and (3) a real problem in forecasting how Iraq might develop. Our view is that this 30m b/day needs to be taken as a marker in the sand (“this is where we would like to see production all things being normal”) but little more than that at present. June 2013 production for OPEC-11 is reported to be around 27.5m b/day, indicating that OPEC is slightly higher but reasonably well aligned with their overall target. None of this changes our view that OPEC may be ill-disciplined when prices are high but remain capable of being totally effective at cutting production when the oil price weakens significantly – as they did in December 2008, 2006, 2001 and 1998.

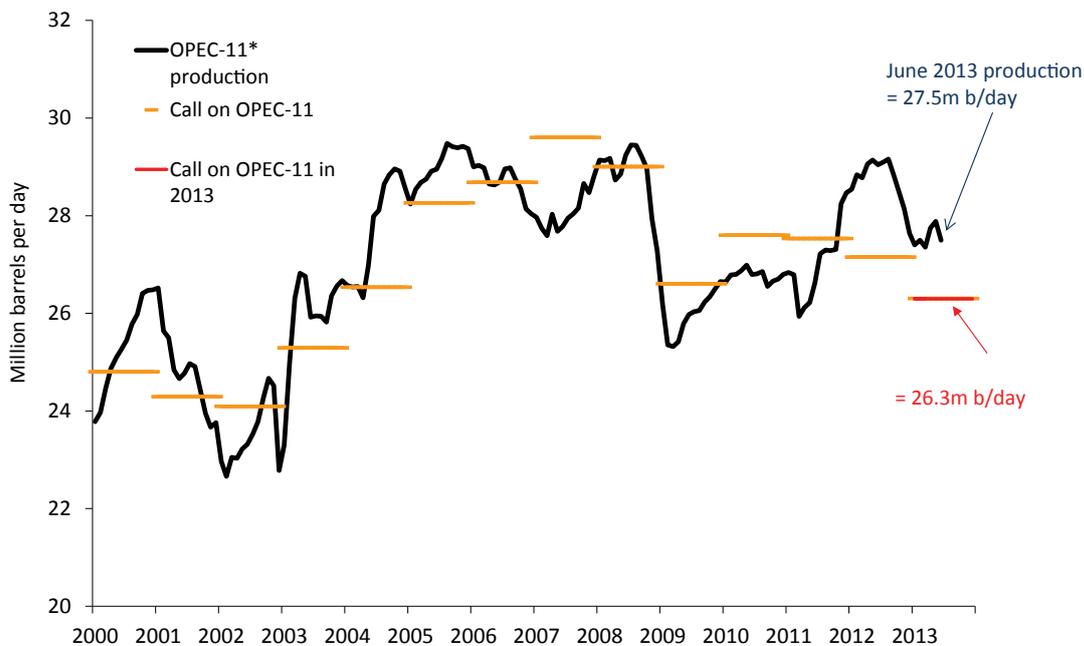
OPEC met in May 2013 and no changes to production levels were made. Little new came out of the conference, with OPEC reiterating its desire to “achieve a stable oil market by ensuring that the market is well supplied to meet demand from consumers at fair and reasonable prices”. The next meeting is scheduled for December 2013.

The table below shows changes in production among OPEC-12 since the end of 2010 and shows how production is running well ahead of pre-Middle East North Africa (MENA) unrest levels. In addition to the non-OPEC problems mentioned above, Saudi Arabia’s increased production is an indication of their desire to see US and European sanctions succeed against Iran (so avoiding military action against Iran by Israel). Saudi is well aware that if the oil price is \$120+, Iran’s overall oil revenues are strong even if production weakens. Saudi production alone is up around 1.2m b/day, and total OPEC-12 production is 1.5m b/day higher than December 2010.

(’000 b/day)	31-Dec-10	30-Jun-13	Change
Saudi	8,250	9,470	1,220
Iran	3,700	2,560	-1,140
UAE	2,310	2,790	480
Kuwait	2,300	2,960	660
Nigeria	2,220	1,830	-390
Venezuela	2,190	2,701	511
Angola	1,700	1,670	-30
Libya	1,585	1,130	-455
Algeria	1,260	1,150	-110
Qatar	820	720	-100
Ecuador	465	516	51
OPEC-11	26,800	27,497	697
Iraq	2,385	3,200	815
OPEC-12	29,185	30,697	1,512

The graph below shows the estimated call on OPEC-11 for 2013, which we currently estimate to be around 26.3m b/day versus apparent production of 27.5m b/day. Given that the market is in reasonable balance, it suggests that the actual call has recently been higher than 26.3m b/day. A number of leading commentators bridge the gap via 'missing' demand, a reference to non-OECD demand, in particular, being higher than the IEA are reporting.

Figure 6: OPEC apparent production vs. call on OPEC 2000 – 2013



Source: Bloomberg/IEA Oil Market Report (June 2013)

### Supply looking forward

The non-OPEC world is struggling to grow production meaningfully. The growth was 2% per annum (p.a.) from 1998-2003, 0.2% p.a. from 2003-2008 and 1.9% p.a. from 2008-2012.

Since 2010, non-OPEC production is up by only 0.7m b/day (0.1m b/day in 2011 and 0.6m b/day in 2012). Nearly all of the growth has come from the successful development of shale oil and oil sands in North America (+1.8m b/day over 2 years), implying that the rest of the non-OPEC region has declined by 0.9m b/day over this period. The decline in the rest of non-OPEC has been driven by a combination of political (Sudan; Syria & Yemen) and operational/geological (UK & Norwegian North Sea) factors.

The IEA forecast non-OPEC supply growing by 1.1m b/day in 2013, driven again by North American supply (+1.0m b/day). Other areas expected to grow their production include Brazil, Sudan and China, offset by declines in the North Sea and Mexico.

Looking further ahead, we must consider in particular potential increases in supply from two regions: Iraq and North America. Starting with Iraq, the question of how big an increase is likely, in what timescale, and the reactions of other OPEC members are all important issues. Our conclusion is that while an increase in Iraqi production may be possible (say, 2m barrels over the next 5 years), if it occurs it will be surprisingly easily absorbed by a combination of OPEC adjustment, if necessary, weak non-OPEC supply growth and continuing growth in demand from developing countries of c.15m b/day over the next 10 years. Iraqi production was running at

3.2m b/day in June 2013, down from a high of 3.6m b/day in mid-2000. Despite this potential, continued unrest across the country does not fill us with confidence that growth can easily be achieved.

The recent growth in US shale oil, in particular from the Bakken, Permian and Eagleford basins, raises the question of how much more there is to come. So far, new oil production from these sources amounts to around 2.0m b/day. Our assessment is that US shale oil is a high cost source of oil but one that is viable at current oil prices. In total, it could be comparable in size to the UK North Sea, i.e. it could grow by a further 2m b/day between now and 2016, though we note recent comments from the management of Core Laboratories, a leading reservoir analysis company, that the market is overestimating the prospectivity of US oil shale. We also observe that since the discovery of the Bakken, Eagleford and Permian, the US has struggled to find another large shale resource, despite 2-3 years of trying.

Similar opportunities to exploit unconventional oil likely exist internationally, notably in Argentina (Vaca Muerta), Russia (Bazhenov), China (Tarim and Sichuan) and Australia (Cooper). However, the US is far better understood geologically; the infrastructure in the US is already in place; service capacity in the US is high and the interests of the landowner are aligned in the US with the E&P company. In most of the rest of the world, the reverse of each of these points is true, and as a result we see international shale 5-10 years behind North America.

We must also keep an eye on future sources of new conventional oil supply outside OPEC. In Kazakhstan, the Kashagan field that is currently in development is expected to begin producing commercial volumes in mid-2013. Though initial volumes are lower, production is anticipated to reach between 1-1.5m b/day by around the end of the decade.

### Demand looking forward

The IEA reported growth in oil demand in 2012 of 0.9m b/day, comprising an increase in non-OECD demand of 1.4m b/day and a decline in OECD demand of 0.5m b/day. The non-OECD growth forecast for 2013 is similar to 2012 at 1.3m b/day. The components of this growth can be summarized as follows:

*Figure 7: Non-OECD oil demand*

Million b/day	Demand					Growth			
	2009	2010	2011	2012	2013	2010	2011	2012	2013
Asia	18.25	19.70	20.28	20.96	21.61	1.45	0.58	0.68	0.65
M. East	7.10	7.32	7.39	7.63	7.81	0.22	0.07	0.24	0.18
Lat. Am.	5.70	6.03	6.29	6.52	6.69	0.33	0.26	0.23	0.17
FSU	4.00	4.15	4.36	4.46	4.58	0.15	0.21	0.10	0.12
Africa	3.37	3.48	3.38	3.52	3.67	0.11	-0.10	0.14	0.15
Europe	0.70	0.68	0.69	0.71	0.71	-0.02	0.01	0.02	0.00
	39.12	41.36	42.39	43.80	45.07	2.24	1.03	1.41	1.27

Source: IEA Oil Market Report (June 2013)

As can be seen, Asia has settled down into a steady pattern of growth since 2010. Collective growth in the Middle East, Latin America, former Soviet Union (FSU) and Africa in 2013 is likely to almost match that in Asia. These other non-OECD regions are all central to the developing world industrialization and urbanization thesis and should not be overlooked.

For OECD demand in 2013, the IEA's forecast of a decline of 0.5m b/day sees North America flat and Europe and the Pacific down. The expected decline in European demand reflects weak economic expectations for the region.

Global oil demand over the next few years is likely to follow a similar pattern, with a shallow decline in the OECD more than offset by strong growth in the non-OECD area. The decline in the OECD reflects improving oil efficiency over time, though this effect will be dampened by population and vehicle growth. Within the non-OECD, population growth and rising oil use per capita will both play a significant part. Price and the trajectory of global GDP will have an effect at any point in the short term, but overall we would not be surprised to see average annual demand growth of around 1.5m b/day to the end of the decade. This would represent a growth rate of 3% p.a., no greater than the growth rate over the last 15 years (3.2% p.a.).

### Conclusions about oil

From the low of \$31.42 on December 22 2008 we saw the oil price (WTI) recover to above \$70 by May 2009, and range trade around \$65-\$85 for the subsequent 20 months. Since November 2010 it has generally moved above this range, trading in a wider range of \$80-\$110. Brent's trading range over the same period has been higher, at \$90-\$125.

The table below summarizes our view by showing our oil price forecasts for WTI and Brent in 2013 against their historic levels, and rises in percentage terms that we have seen in the period from 2002 to 2012.

*Figure 8: Average WTI & Brent yearly prices, and changes*

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013e
Average WTI (\$)	31.2	41.7	56.6	66.1	72.2	99.9	61.9	79.5	95.0	94.1	95
Average Brent (\$)	28.9	38.5	54.7	65.5	73.2	97.1	62.5	79.7	111.0	112.0	105
Average Brent and WTI	30.1	40.1	55.7	65.8	72.7	98.5	62.2	79.6	103.0	103.1	100
Average Brent and WTI Change <sup>+</sup> y-o-y (\$)		10.1	15.6	10.2	6.9	25.8	-36.3	17.4	23.4	0.05	-3.05
Avg Change <sup>+</sup> y-o-y (%)		33%	39%	18%	10%	35%	-37%	28%	29%	0%	-3%

We think the most likely scenario going forward is that we will see the average price of Brent and WTI in the trading range of \$90-110. Once the floor of this range looks threatened, OPEC will start to cut back and any significant price weakness below \$100 (Brent) will be prevented by OPEC cuts. Should the oil price rise much over \$125 and we think demand will start to weaken, putting a ceiling on the price for the time being (absent a supply shock).

In the short term, the restoration of most of Libya's oil production post-civil war is being countered by supply disruption in Syria, Yemen and foremost, Iran. In Syria, with Hezbollah and Iran backing the Alawite/Shia minority government and Saudi sources financing the arming of Sunni rebels, there is a clear risk that Iran responds by trying to destabilize the Shia (oil producing) eastern region of Saudi Arabia. As regards Iran, the continuing rhetoric between Iran and the West, with US and European policy of oil embargoes from July, underlines that we are only one ill-judged military move away from another oil spike. In Iraq stability remains elusive. At the heart of it all, we believe that Saudi are working hard to try and maintain a 'good' oil price (Brent at \$100-110).

## Natural gas market

### Supply & demand recent past

On the demand side, industrial gas demand and electricity gas demand, each about a third of total US gas demand, are key. Commercial and residential demand, which make up the final third, have been fairly constant on average over the last decade – although yearly fluctuations due to the coldness of winter weather can be marked.

Industrial demand (of which around 30% comes from petrochemicals) tends to trend up and down depending on the strength of the economy, the level of the US dollar and the differential between US and international gas prices. Between 2000 and 2009 industrial demand was in steady decline, falling from 22.2 Bcf/day to 16.9 Bcf/day. Since 2009 the lower gas price (particularly when compared to other global gas prices) and recovery from recession has seen demand rebound, up in 2012 to around 19.5 Bcf/day.

The supply side fundamentals for natural gas in the US are driven by 5 main moving parts: onshore and offshore domestic production, net imports of gas from Canada, exports of gas to Mexico and imports of liquefied natural gas (LNG). Of these, onshore supply is the biggest component, making up over 80% of total supply.

Since the middle of 2008 the weakening gas price in the US reflects growing onshore US production driven by rising gas shale and associated gas production (coming from growing onshore US oil production). These trends initially were mitigated by declining offshore production and falling net Canada and LNG imports and rising exports to Mexico. Most recently, from about September 2011, the mitigating factors became exhausted and a net imbalance developed. This, combined with very warm winter temperatures in early 2012, caused gas in storage to balloon and precipitated a gas price sell off. Since around April 2012, we have seen the gas rig count fall month on month as producers seek to cut back supply. We also saw significant coal to gas switching by US electric utilities, particularly during the summer of 2012, though much of these have now unwound again.

Total gas demand in 2012 (excluding Canadian exports) is estimated to have been 71.8 Bcf/day, up by 3.3 Bcf/day (4.8%) vs 2011 and up 6.1 Bcf/day (9%) vs the 5 year average. The principal contributor to the increase in 2012 vs 2011 was power generation (+4.2 Bcf/day), driven by coal to gas switching. Other notable changes were industrial demand (+0.6 Bcf/day), exports to Mexico (+0.4 Bcf/day) and residential/commercial demand (-2.2 Bcf/day) which was pulled lower by the very warm start to 2012.

Overall, while gas demand in the US has been reasonably strong over the past three years, it has been trumped over this period by a rise in onshore supply, pulling the gas price lower.

### Supply Outlook

#### *Change in Rig Count*

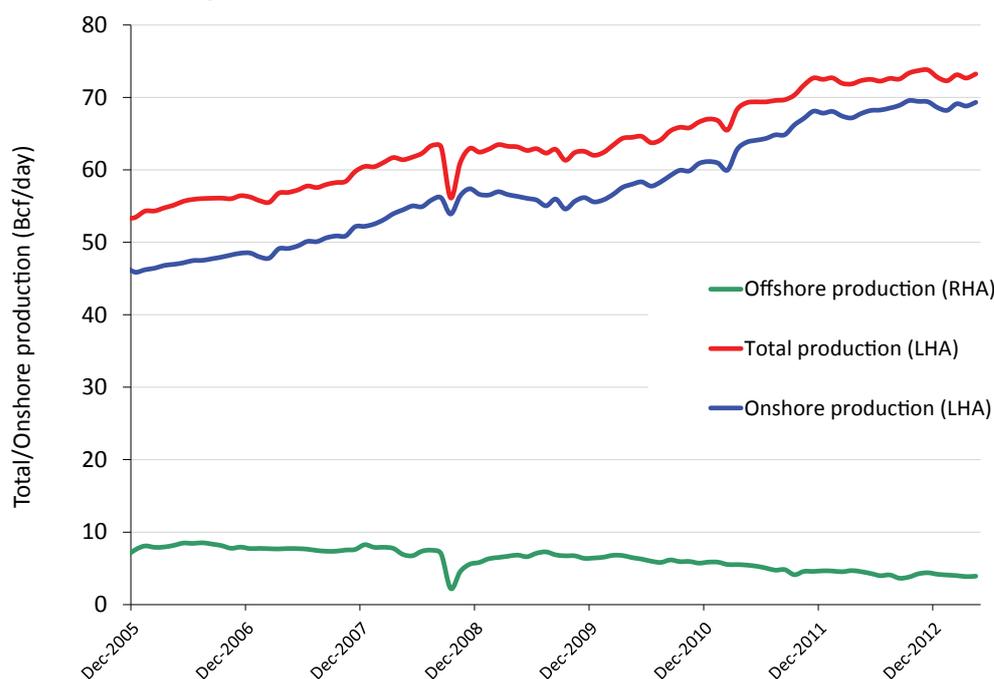
The onshore drilling rig count is the key driver of gas supply. When looking at changing totals, however, the accelerating shift from vertical to horizontal drilling has to be factored in as too does growing associated gas from rising onshore oil production, itself linked to a rising US oil rig count.

In total, the onshore gas rig count has dropped from a 1,606 peak in September 2008 to 353 at end-June 2013. Over the same period the oil rig count has risen from 416 to 1,390. The total number of rigs has therefore declined recently but not changed dramatically (it has gone from 2,031 Aug 2008 to 1,990 Sep 2011 to 1,748 June 2013). Within this, however, the mix has changed as illustrated by the following table:

RIG COUNT BHI	Aug 2008		Sep 2011		Jun 2013	
Gas Rigs	1606		923		353	
Oil Rigs	416		1060		1390	
Misc Rigs	9		7		5	
<b>Total Rigs</b>	<b>2031</b>		<b>1990</b>		<b>1748</b>	
		%		%		%
Horizontal Rigs	626	31%	1135	57%	1067	61%
Directional Rigs	388	19%	238	12%	240	14%
Vertical Rigs	1017	50%	617	31%	441	25%
<b>Total Rigs</b>	<b>2031</b>	<b>100%</b>	<b>1990</b>	<b>100%</b>	<b>1748</b>	<b>100%</b>

One result of the change from vertical to horizontal drilling has been that onshore gas supply has continued to rise (the average productivity per rig has grown significantly) and is now at c 69.3 Bcf/day, around 11.9 Bcf/day (20%) above the 57.4 Bcf/d peak in 2009 before the rig count collapsed. But as we mentioned earlier, we do not believe this growing excess in production over demand can continue indefinitely with natural gas trading well below the marginal cost of supply: a combination of reduced capital spending by the exploration companies, lowering production, and growing natural gas demand stimulated by the low gas price will rebalance the market, as is now happening.

Figure 9: US natural gas production 2005 – 2013 (Lower 48 States)



Source: EIA 914 data (April 2013 published in June 2013)

### Liquid natural gas (LNG) arbitrage

The UK national balancing point (NBP) gas price – which serves as a proxy to the European traded gas price – edged up in June and remains at a very significant premium to the US gas price (\$10.00 versus \$3.56). LNG supplies to the UK have been somewhat constrained, particularly in light of strong demand for LNG to Asian markets. This, together with a prolonged European winter, has been helping to support the price in recent months. US LNG imports remained well below 1 Bcf/day in May as cargoes took advantage of the higher prices in Europe and Asia.

Canadian imports into the US

Net Canadian imports of gas into the US dropped from 9.1 Bcf/day in 2007 to 5.4 Bcf/day (estimated) in 2012. This was initially driven by falling rig counts and a less attractive royalty regime enacted in 2007 and has accelerated due to increased domestic demand from Canadian oil sands development. Although the Canadian rig count has recovered somewhat, we expect net imports to continue to decline in 2013 to around 5 Bcf/day.

**Demand Outlook**

For 2013, we expect demand from power generation to be down on 2012 (a reversal of much of the 2012 coal to gas switching if the gas price stays above \$3) but about 1-1.5 Bcf/day above 2011. Residential and commercial gas demand will as ever be weather dependent, but assuming average temperatures, we believe demand should be around 2 Bcf/day better than 2012 and unchanged from 2011. And we expect industrial consumption about 0.3 Bcf/day above 2012. Overall, assuming average weather, we expect 2013 demand to be around 71-72 Bcf/day, down a little on 2012 but around 2.5-3 Bcf/day higher than 2011.

Looking out further, the low US gas price has stimulated various initiatives that are likely have a material impact on demand from 2015/16 onwards. The most significant is the group of LNG export terminals in the US and Canada which are in the planning/early construction stages. There are over 26 bcf/day of LNG export projects proposed in the US today, plus a further 6 bcf/day in Canada, as shown below:



#	Terminal	Sponsor	MTPA Capacity	BCF/day Capacity
<b>US – Approved</b>				
1	Sabine Pass	Cheniere	16.0	2.6
<b>US – FERC Review</b>				
2	Freeport	Freeport	10.0	1.8
3	Corpus Christi	Cheniere	13.5	1.8
4	Coos Bay	Jordan Cove	6.0	0.9
5	Lake Charles	ETE-BG	7.0	2.4
6	Hackberry (Cam)	Sempra	12.0	1.7
7	Cove Point	Dominion Res.	7.2	1.0
8	Astoria	Oregon LNG	8.0	1.3
<b>US – Proposed</b>				
9	Alaska LNG	XOM-BP-COP	15.0	3.0
10	Brownsville	Gulf Coast LNG	20.6	2.8
11	Pascagoula	Gulf LNG	9.0	1.5
12	Lavaca Bay	Excelerate	8.5	1.4
13	Elba Island	ETE	3.0	0.5
14	Golden Pass	XOM	16.0	2.6
15	Plaquemines Parish	CE FLNG	7.5	1.1
<b>US Total</b>			<b>159.3</b>	<b>26.4</b>
<b>Canada – Review</b>				
16	Kitimat	EOG-APA-ECA	5.5	0.7
17	BC LNG	Var.	1.8	0.3
18	LNG Canada	RDS	24.0	3.6
<b>Canada – Proposed</b>				
19	Prince Rupert	Petronas	8.5	1.0
20	Ridley Island	BG	8.5	1.0
<b>Canada Total</b>			<b>48.3</b>	<b>6.6</b>

Source: Bernstein, Guinness Atkinson Asset Management (June 2013)

Not all these facilities will be built but we think that exports of between 6-10 bcf/day from the US by 2020, or around 10-15% of new demand, are likely. Additional LNG exports from Canada will contribute a few extra bcf, tightening the natural gas balance across North America. Importantly, the Department of Energy (DoE)-sponsored report concluded that LNG exports will have a net benefit to the US economy and that benefits are likely to increase as LNG exports rise.

Industrial demand will also grow thanks to the construction of new petrochemical plants: Dow Chemical and Chevron Phillips have large new Gulf Coast facilities planned for 2017, the first new crackers to be built in the US since 2001.

We believe that gas will continue to take the majority of incremental power generation growth in the US. The combined cycle gas turbine fleet (CCGT) operated in 2010 at 39% of capacity versus the coal fleet at 70% of capacity. 2012 has given us a glimpse of the scale of switching that is possible, and while the CCGT fleet will not reach 70% anytime soon (it is not all in the 'right place' geographically), we do expect it to grow its underlying market share and add several Bcf/day to gas demand over the next few years. Our working assumption is 1 Bcf/day per year.

We also watch with interest the efforts being made to increase the usage of liquified petroleum gas (LPG) and LNG by the US truck, bus and delivery van fleets. Whether this will gain traction is hard to know. If it does its impact will be meaningful. If the entire fleet described above moved to gas, we estimate that it would increase demand by 18 Bcf/day. A much smaller transport market but one that might be easier to convert is the US railways. BNSF Railway announced in March 2013 that they would trial a switch for their train engines from diesel to liquefied natural gas. BNSF Railway is the US's second largest freight railroad network. Rail engines in the US currently consume around 0.25m b/day of distillate, equivalent to around 1.5 Bcf/day of gas.

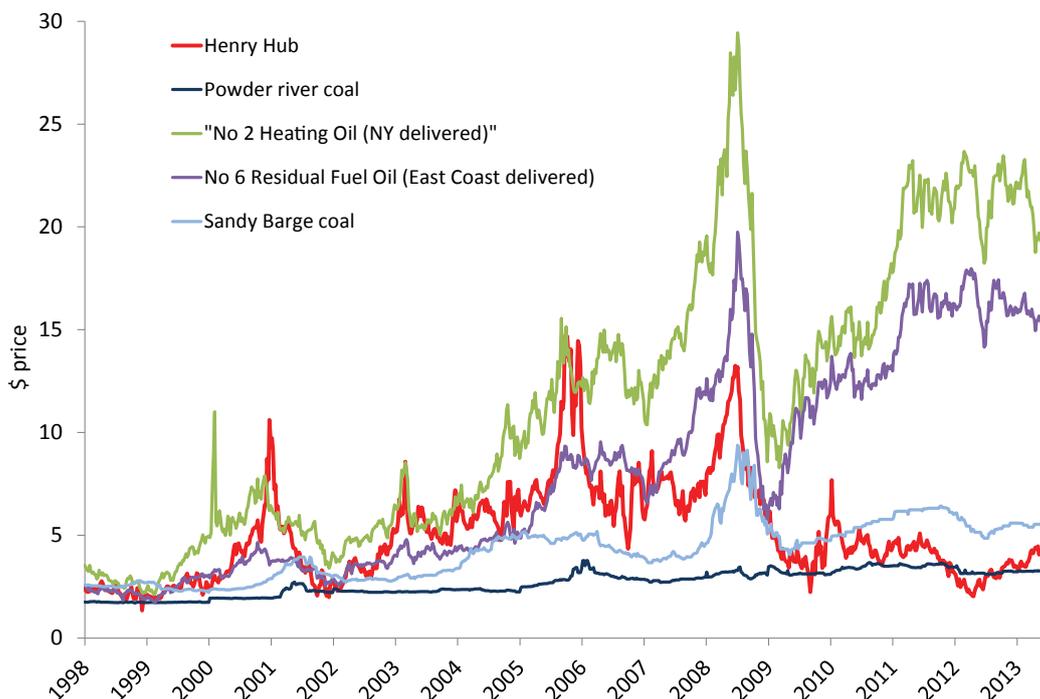
**Other**

*Relationship between gas price and other energy commodity prices in the US*

The oil/gas price ratio (\$ per bbl WTI/\$ per mcf Henry Hub) of 27.1x at the end of June continues well outside the more normal ratio of 6-9x. If the oil price averages around \$95 in 2013 and the relationship between the oil and gas price returning to its longer-term average of 6-9x, this would imply the gas price increasing back to above \$10 once the gas market has returned to balance. This is quite a thought and a long way away from current market sentiment.

The following chart of the front month US natural gas price against heating oil (No 2), residual fuel oil (No 6) and coal (Sandy Barge adjusted for transport and environmental costs) seeks to illustrate how coal and residual fuel oil switching provide a floor and heating oil a ceiling to the natural gas price. With the gas price trading below the coal price support level for the first 8 months of 2012, resulting coal to gas switching for power generation was significant. It will be interesting to see how much of the switching persists in 2013 with gas back above \$3.50/Mcf – some but not all, we think.

**Figure 10: Natural gas versus substitutes (fuel oil and coal)**  
Henry Hub vs residual fuel oil, heating oil, Sandy Barge (adjusted) and Powder River coal (adjusted)



## Conclusions about US natural gas

The US natural gas price bottomed in 2012 and the recovery has begun. Natural gas at around \$3.75 spot is nearly double the April 2012 low but still below the (full cycle) marginal cost of supply and as the depressed rig count holds back new supply we expect the price to recover further. We believe the gas price may then be held around the \$4-5 range for a period until demand grows further and longer term we expect the price to normalize to \$6-8.

## 6. Appendix: Oil and Gas markets historical context

Figure 11: Oil price (WTI \$) last 23 years.



Source: Bloomberg

For the oil market, the period since the Iraq Kuwait war (1990/91) can be divided into two distinct periods: the first 9-year period was broadly characterized by decline. The oil price steadily weakened 1991 - 1993, rallied between 1994 -1996, and then sold off sharply, to test 20 year lows in late 1998. This latter decline was partly induced by a sharp contraction in demand growth from Asia, associated with the Asian crisis, partly by a rapid recovery in Iraq exports after the UN Oil for food deal, and partly by a perceived lack of discipline at OPEC in coping with these developments.

The last 13 years, by contrast, have seen a much stronger price and upward trend. There was a very strong rally between 1999 and 2000 as OPEC implemented 4m b/day of production cuts. It was followed by a period of weakness caused by the rollback of these cuts, coinciding with the world economic slowdown, which reduced demand growth and a recovery in Russian exports from depressed levels in the mid 90's that increased supply. OPEC responded rapidly to this during 2001 and reintroduced production cuts that stabilized the market relatively quickly by the end of 2001.

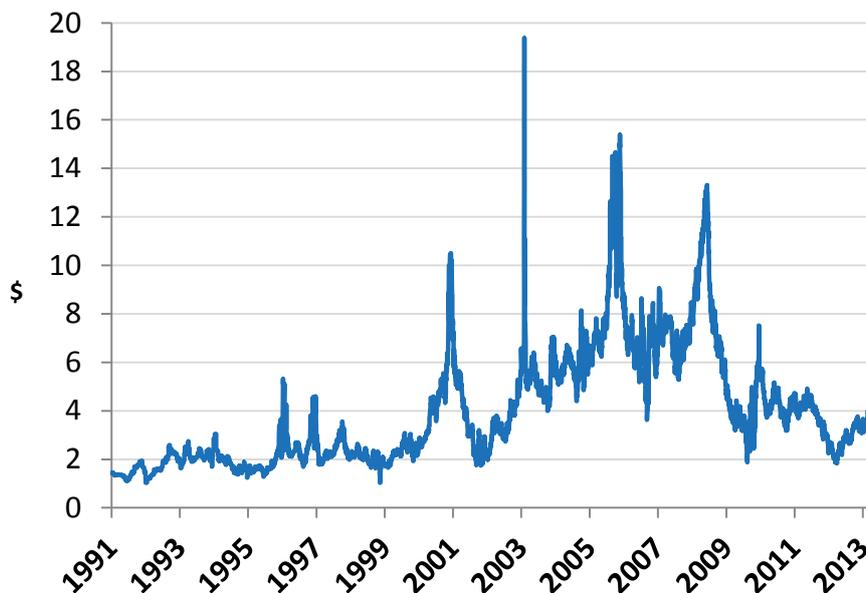
Then, in late 2002 early 2003, war in Iraq and a general strike in Venezuela caused the price to spike upward. This was quickly followed by a sharp sell-off due to the swift capture of Iraq's Southern oil fields by Allied Forces and expectation that they would win easily. Then higher prices were generated when the anticipated recovery in Iraq production was slow to materialise. This was in mid to end 2003 followed by a much more normal phase with positive factors (China demand; Venezuelan production difficulties; strong world economy) balanced against negative ones (Iraq back to 2.5 m b/day; 2Q seasonal demand weakness) with stock levels and speculative activity needing to be monitored closely. OPEC's management skills appeared likely to be the critical determinant in this environment.

By mid-2004 the market had become unsettled by the deteriorating security situation in Iraq and Saudi Arabia and increasingly impressed by the regular upgrades in IEA forecasts of near record world oil demand growth in 2004 caused by a triple demand shock from strong demand simultaneously from China; the developed world (esp. USA) and Asia ex China. Higher production by OPEC has been one response and there was for a period some worry that this, if not curbed, together with demand and supply responses to higher prices, would cause an oil price sell off. Offsetting this has been an opposite worry that non OPEC production could be within a decade of peaking; a growing view that OPEC would defend \$50 oil vigorously; upwards pressure on inventory levels from a move from JIT (just in time) to JIC (just in case); and pressure on futures markets from commodity fund investors.

After 2005 we saw a further strong run-up in the oil price. Hurricanes Katrina and Rita which devastated New Orleans caused oil to spike up to \$70 in August 2005, and it spiked up again in July 2006 to \$78 after a three week conflict between Israel and Lebanon threatened supply from the Middle East. OPEC implemented cuts in late 2006 and early 2007 of 1.7 million barrels per day to defend \$50 oil and with non-OPEC supply growth at best anaemic demonstrated that it could to act a price-setter in the market at least so far as putting a floor under it.

Continued expectations of a supply crunch by the end of the decade, coupled with increased speculative activity in oil markets, contributed to the oil price surging past \$90 in the final months of 2007 and as high as \$147 by the middle of 2008. This spike was brought to an abrupt end by the collapse of Lehman Brothers and the financial crisis and recession that followed, all of which contributed to the oil price falling back by early 2009 to just above \$30. OPEC's responded decisively and reduced output, helping the price to recover in 2009 and stabilise in the \$70-95 range where it remained for two years. Since 2011 we have seen a disconnect between the WTI and Brent oil benchmarks due to US domestic oversupply affecting WTI. The WTI price has generally moved up and into a wider range of \$80-\$110, whilst Brent's trading range over the same period has been higher, at \$90-\$125, with the pressures of non-OECD demand persistently outstripping non-OPEC supply and supply tensions in the Middle East/North Africa prevailing.

**Figure 12: North American gas price last 22 years (Henry Hub \$/Mcf)**



Source: Bloomberg

With regard to the US natural gas market, the price traded between \$1.50 and \$3/Mcf for the period 1991 - 1999. The 2000s were a more volatile period for the gas price, with several spikes over \$8/mcf, but each lasting less than 12 months. On each occasion, the price spike induced a spurt of drilling which brought the price back down. Excepting these spikes, from 2004 to 2008, the price generally traded in the \$5-8 range.

Since 2008, the price has averaged below \$4 as progress achieved in 2007-8 in developing shale plays boosted supply while the 2008-09 recession cut demand. Demand has been recovering since 2009 but this has been outpaced by continued growth in onshore production.

North American gas prices are important to many E&P companies. In the short-term, they do not necessarily move in line with the oil price, as the gas market is essentially a local one. (In theory 6 Mcf of gas is equivalent to 1 barrel of oil so \$60 per barrel equals \$10/Mcf gas). It remains a regional market more than a global market because the infrastructure to export LNG from North America is not yet in place.

**Tim Guinness**

Chairman & Chief Investment Officer

**Will Riley & Ian Mortimer**

Fund investment team

Commentary for our views on Alternative Energy and Asia markets is available on our website. Please [click here](#) to view.

**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 affect on the funds holdings.**

MSCI World Energy Index is the energy sector of the MSCI World Index (an unmanaged index composed of more than 1400 stocks listed in the US, Europe, Canada, Australia, New Zealand, and the Far East) and as such can be used as a broad measurement of the performance of energy stocks. Indices do not incur expenses and are not available for investment.

The 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.

One cannot invest directly in an index.

Price to earnings (P/E) ratio (PER) reflects the multiple of earnings at which a stock sells and is calculated by dividing current price of the stock by the company's trailing 12 months' earnings per share.

Earnings per share (EPS) is calculated by taking the total earnings divided by the number of shares outstanding.

Book Value is the net asset value of a company, calculated by subtracting total liabilities from total assets.

Enterprise value is defined as the market capitalization of a company plus debt minus total cash and cash equivalents.

Price to Discounted Cash Flow (DCF) is a valuation method used to estimate the attractiveness of an investment opportunity and calculated by dividing current price of the stock by DCF, which is an analysis that uses future free cash flow projections and discounts them (most often using the weighted average cost of capital) to arrive at a present value.

PV10 is the present value of estimated future oil and gas reserves, net of estimated direct expenses, discounted at an annual discount rate of 10%. It is used to estimate the present value of a company's proved oil and gas reserves.

Price to Book (P/B) Ratio 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.

Cash Flow Return on Investment (CFROI) is a valuation model that assumes the stock market sets prices based on cash flow, not on corporate performance and earnings.

Free cash flow is revenue less operating expenses including interest expense and maintenance capital spending. It is the discretionary cash that a company has after all expenses and is available for purposes such as dividend payments, investing back into the business or share repurchases.

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