Guinness Atkinson
Global Energy Fund
Review of Q1 2019

GUINNESS ATKINSON FUNDS

REPORT HIGHLIGHTS

OIL

Brent and WTI higher on OPEC cuts and demand resilience

The Brent oil price started the quarter at $52/bl and rose steadily to close the quarter just below its highs at $67/bl. Brent is averaging $63/bl so far in 2019, down from $72/bl during 2018, but higher than the average level for 2017 ($55/bl). The West Texas Intermediate (WTI) oil price traded in a similar fashion, rising from $45/bl to $60/bl over the quarter. Longer dated oil prices were more subdued: the five year forward Brent and WTI prices both up by around 1% over the quarter.

NATURAL GAS

US gas price still range bound despite inventories being at ten-year lows

The US spot gas price has averaged $2.93/mcf so far in 2019, which compares to an average gas price of $3.07 in 2018 and $3.02 in 2017. Inventories remain close to 10-year low levels, but supply is responding strongly. European and Asian gas prices down over the quarter on mild winter weather (depressing demand) and high levels of LNG imports.

EQUITIES

Energy outperform the broad market

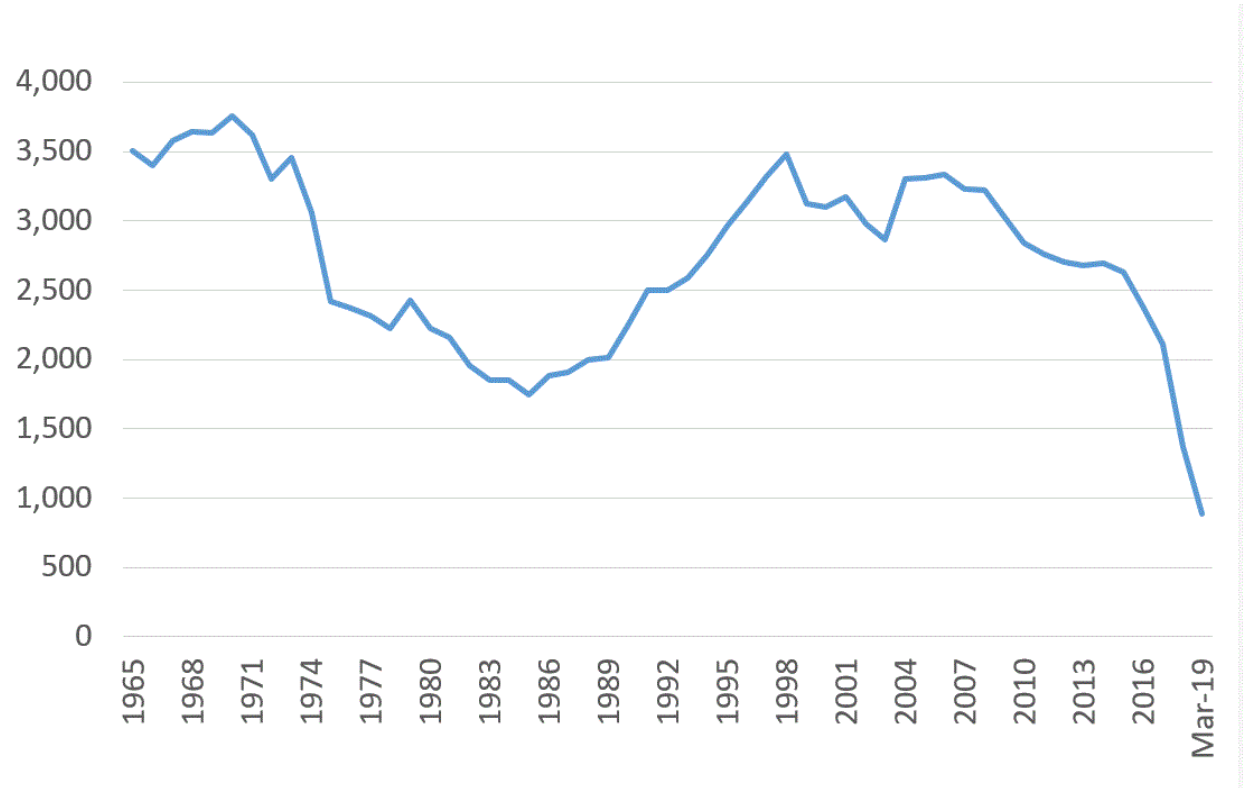
The main index of oil and gas equities, the MSCI World Energy Index, was up by 14.45% in the first quarter of 2019. The S&P 500 Index was up by 13.65% over the same period. The Guinness Atkinson fund was up by 15.11% over this period (all in US dollar terms).

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 https://www.gafunds.com/our-funds/#fund_performance or call (800) 915-6566.

CHART OF THE QUARTER – Venezuelan oil production falls below 1m b/day

The imposition of sanctions by the US government have driven Venezuelan oil production sharply lower, with supply in March reported to be 0.9m b/day. The sanctions are not only holding up oil exports, but also hindering the import of lighter oil products into Venezuela which are used as diluents for processing the country's heavy oil. The sanctions are compounding the problems for Venezuela's oil industry, coming after years of mismanagement and underinvestment. Please see this month's manager's comments for more analysis.

Venezuelan oil production (000s b/day)

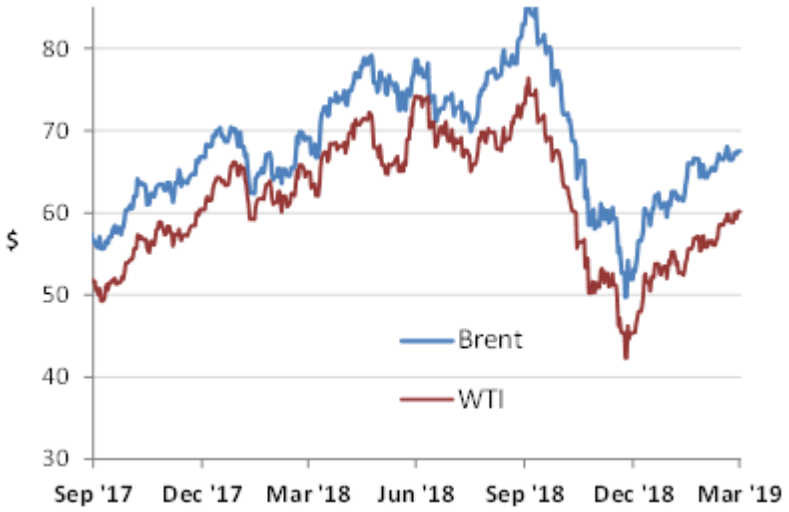


First Quarter 2019 in Review
Manager's Comments
Performance: Guinness Atkinson Global Energy Fund
Portfolio: Guinness Atkinson Global Energy Fund
Outlook

Q1 2019 in Review

Oil Market

Figure 1: Oil price (WTI and Brent $/barrel) 18 months September 30, 2017 to March 31, 2019



Source: Bloomberg LP

Spot oil prices, a key driver of the sector, rose over the quarter. The Brent oil price started the quarter at $52/bl and rose steadily to close the quarter just below its highs at $67/bl. Brent is averaging $63/bl so far in 2019, down from $72/bl during 2018, but higher than the average level for 2017 ($55/bl). The West Texas Intermediate (WTI) oil price traded in a similar fashion, rising from $45/bl to $60/bl over the quarter. Longer dated oil prices were more subdued: the five year forward Brent and WTI prices both up by around 1% over the quarter.

Factors which strengthened WTI and Brent oil prices in the quarter:

• Lower production from OPEC countries after quota cut

Total OPEC-11 production in March 2019 is estimated by Bloomberg at 29.7m b/day, down by 0.2m b/day versus February 2019. If these figures are accurate, they imply that OPEC-11 production has declined by 2.2m b/day since November 2018, when the latest quota cuts were announced. Saudi has shouldered the majority of the decline, their production down by 1.2m b/day since November.

• US drilling rig count falling

The US onshore drilling rig count fell by 27 rigs in March, taking the total decline in 2019 to 69 rigs (-8%). This increases expectations of a more pronounced slowdown in US shale oil production growth later in 2019. There is typically a 5-6 month lag from rig count change to production change.

• Venezuela production remains under pressure

The situation in Venezuela continues to be highly problematic with estimates that production in March fell to 0.9m b/day, having been around 1.2m b/day in late 2018. Reliance Industries, for example, Venezuela's top customer in India, has capped oil purchases from Venezuela and halted selling diluent following U.S. pressure to cripple President Nicolas Maduro's government. It seems that India has struck a deal with the US Government to reduce purchases of Venezuelan crude in exchange for continued import waivers for Iranian oil. More widely, the oil industry in Venezuela is currently hampered by rolling power outages.

Factors which weakened WTI and Brent oil prices in the quarter:

- **Concerns around global oil demand**

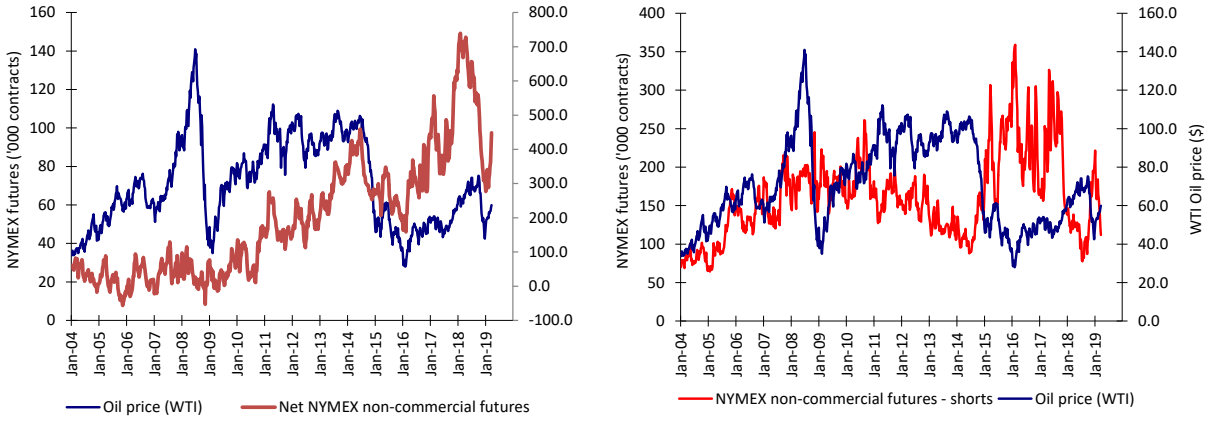
In January the IMF downgraded their view of global GDP growth for 2019 to 3.3%, having previously forecast 3.5% growth. If this forecast proves to be accurate, it would likely dent global oil demand growth. Nonetheless, the IEA published their latest oil demand forecast in March and maintain a growth rate of 1.4m b/day, unchanged since the start of the year.

- **Increase in US onshore oil supply**

At the start of April, the EIA reported that US onshore production decreased by 89k b/day during January 2019. However, year over year growth for the US onshore system was still running at around 1.6m b/day, by far the biggest growth driver for oil supply globally. With the US drilling rig count now falling, we expect the rate of production growth to moderate later in 2019.

Speculative and investment flows
The New York Mercantile Exchange (NYMEX) net non-commercial crude oil futures open position was 448,000 contracts long at the end of March versus 328,000 contracts long at the end of February. The net position peaked in February 2018 at 739,000 contracts long. Typically, there is a positive correlation between the movement in net position and movement in the oil price. The gross short position declined to 111,000 contracts between the end of March versus 158,000 at the end of February.

Figure 2: NYMEX Non-commercial net and short futures contracts: WTI January 2004 – March 2019

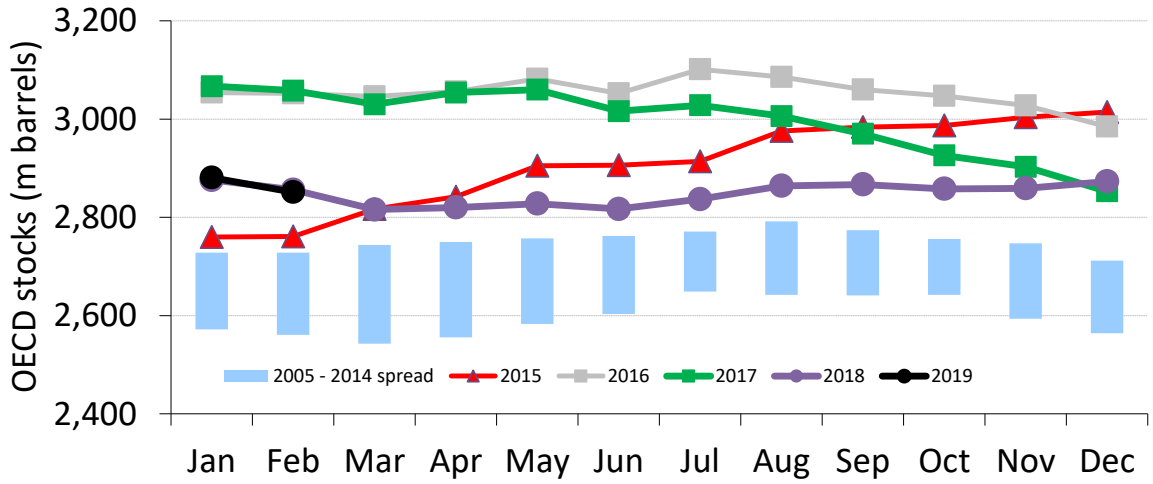


Source: Bloomberg LP/NYMEX/ICE (2019)

OECD stocks

OECD total product and crude inventories at the end of February (latest data point) were estimated by the IEA to be 2,851m barrels, down by 30m barrels versus the level reported for January. This compares to a 10-year average decrease for February of 14m barrels, implying that the market loosened over the month by around 0.5m b/day. Inventories were broadly flat in 2018.

Figure 3: OECD total product and crude inventories, monthly, 2004 to 2019



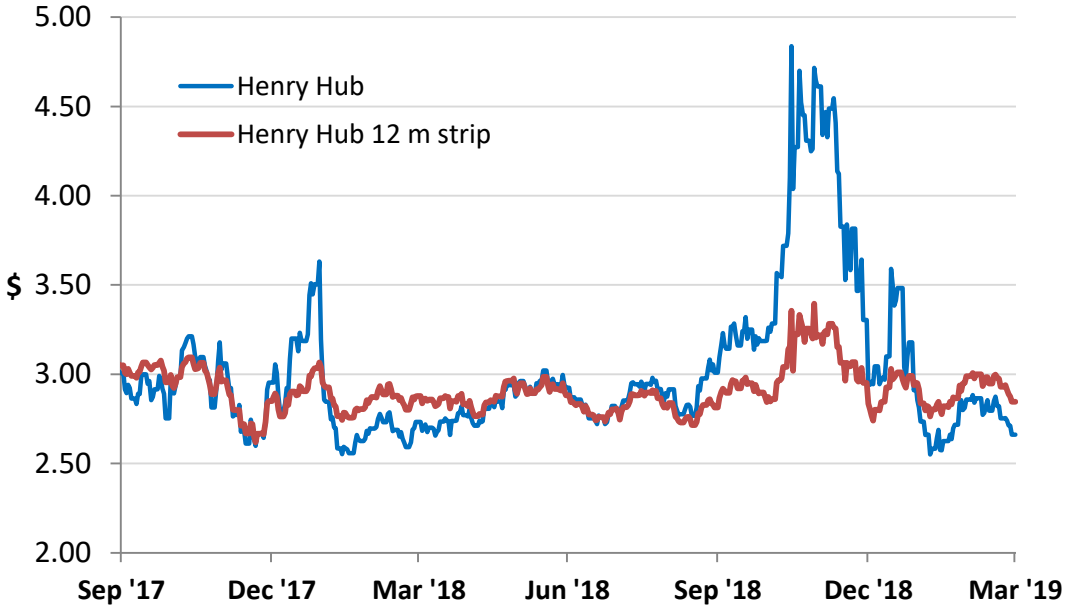
Source: IEA Oil Market Reports (March 2019 and older)

Natural gas market

The spot gas price has averaged $2.93/mcf so far in 2019, which compares to an average gas price of $3.07 in 2018, $3.02 in 2017, $2.55/mcf in 2016 and $2.61/mcf in 2015.

The 12-month gas strip price (a simple average of settlement prices for the next 12 months' futures prices) declined over the quarter, closing at $2.85 /mcf. The strip price averaged $2.90 in 2018, $3.12 in 2017, $2.84 in 2016 and $2.86 in 2015.

Figure 4: Henry Hub gas spot price and 12m strip ($/Mcf) September 30, 2017 to March 31, 2019

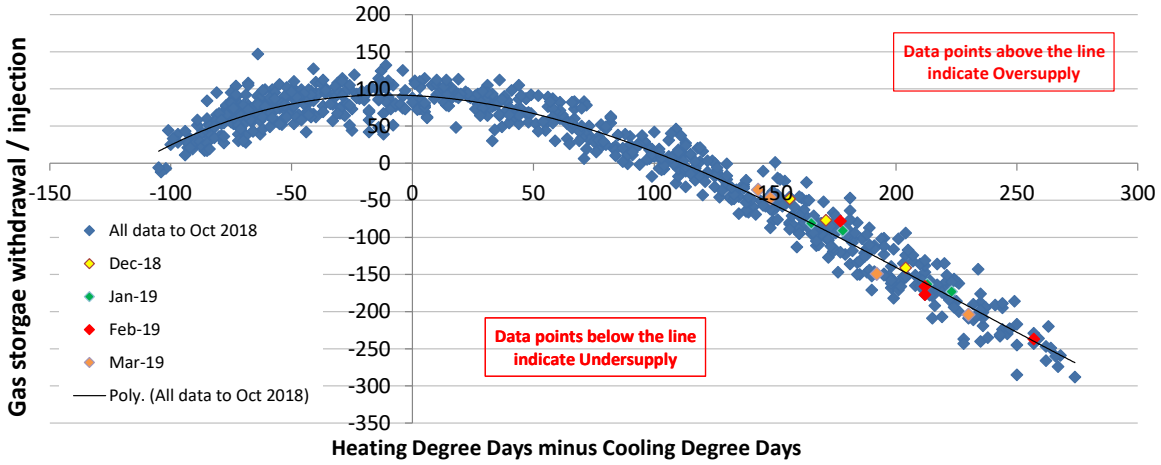


Source: Bloomberg

Factors which weakened the US gas price over the quarter included:

- **Strong US onshore natural gas production**
  Onshore US natural gas production averaged 95.2 Bcf/day in January 2019 (the latest available data point), up by 11.8 Bcf/day on the level reported twelve months earlier. Rising associated gas supply from shale oil, and a pickup of activity in the Marcellus basin, are the key reasons for the rise in production: both look set to continue for the rest of 2019.
- **Structurally oversupplied market**
  Adjusting for the impact of weather in March, the most recent movements of gas in storage suggest the market is, on average, operating at a surplus of around 1 Bcf/day (as indicated by the green dots on the graph below).

Figure 5: Weather adjusted US natural gas inventory injections and withdrawals (from December 2010)



Source: Bloomberg LP; Guinness Atkinson Asset Management

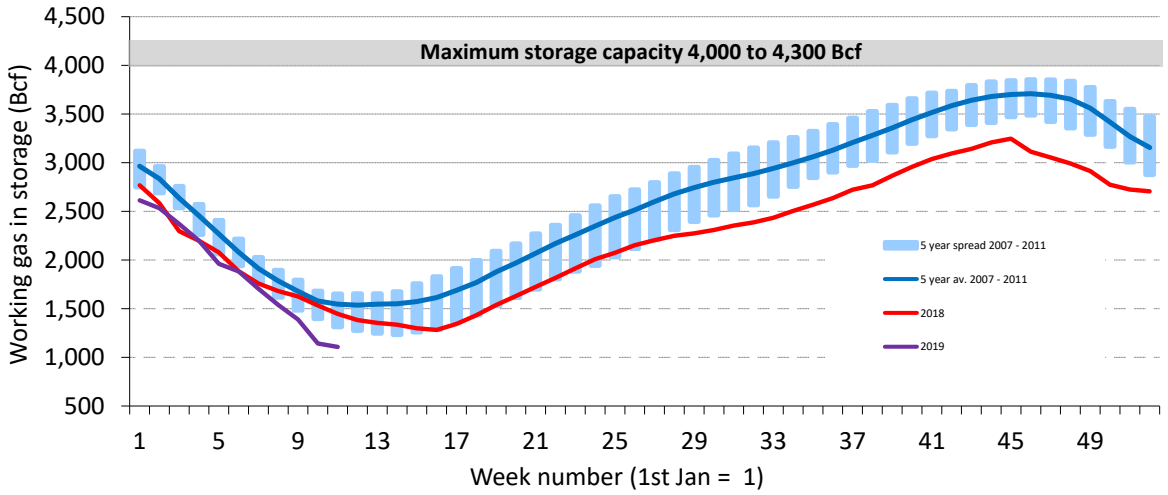
Factors which strengthened the US gas price over the quarter included:

- **Depressed gas inventories**
  US natural gas inventories were estimated to be around 1.11 Tcf at the end of March (nearly 0.7 Tcf lower than the 10-year average) and close to a 10-year low. The market remains sanguine about the tightness of this market (seeing a fall in the 12-month pricing strip since the start of the year) in the face of continued supply increases via associated gas (from shale oil) and the north-east of the US.

Natural gas inventories

Swings in the balance for US natural gas should, in theory, show up in movements in gas storage data. Natural gas inventories at the end of March were reported by the EIA to be 1.1 Tcf. Current gas in storage is, therefore, close to 10-year low levels (only 2014 saw a lower level of storage at this point in the year) as a result of weather and strong demand plus increasing volumes of gas exported via LNG. Whilst gas inventories today are low, the high visibility of low-cost supply growth for 2019 is keeping a cap on prices.

Figure 6: Deviation from 5yr gas storage norm vs gas price 12-month strip (H. Hub $/Mcf)



Source: Bloomberg; EIA (April 2019)

Manager's Comments

This quarter, we have chosen to compare the outlook for oil production from Venezuela and the Permian Basin in Texas: two of the most significant variables for global crude oil supply in 2019 and beyond. While production from Venezuela is in near freefall as a result of mismanagement, low reinvestment and US sanctions, we find that the Permian Basin is benefitting from higher capital inflows, efficiency improvements, new pipelines and substantially improved regional pricing.

Venezuela: mismanagement of the largest oil reserves in the world likely to continue

According to the BP Statistical Review of World Energy, Venezuela held 303bn barrels of proven oil reserves at the end of 2017. This made Venezuela the largest country in the world in terms of proven oil reserves; ahead of Saudi Arabia with 266bn barrels, Canada with 169bn barrels and Iran with 157bn barrels. At the production rate achieved in 2017 (2.1m b/day) the reserves in Venezuela will last for another 393 years.

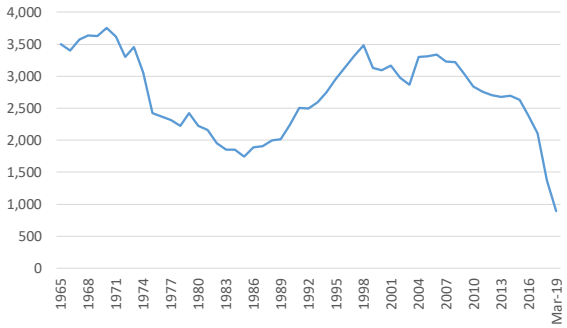
Venezuela's oil reserves are both conventional and unconventional. Prior to mid-2000s, Venezuela's reported conventional proven oil reserves were around 100bn barrels, located both onshore and offshore. Then, in the mid-2000s, Venezuela commenced unconventional production of heavy oil from the Orinoco Belt, when Conoco, Phillips, Texaco, Exxon, TOTAL and Statoil invested more than $12bn into four heavy oil upgrader projects: Sincor,

Petrozuata, Hamaca and Cerro Negro. This allowed the country's estimates of proven oil reserves to increase very sharply, reaching the current level of around 300bn barrels.

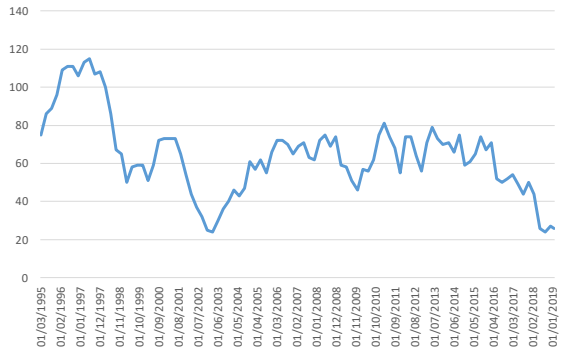
A long-term downward production history

Despite the high level of proven oil reserves, the production history of Venezuela has been problematic and in long-term decline. Production reached a peak of 3.8m b/day in 1970 and then fell to a low of just under 2m b/day in the early 1980s, consistent with OPEC quota restrictions at the time. Conditions started to turn down again from 2002 when nearly half the oil workers at the State Oil Company PdVSA went on strike. This resulted in production falling temporarily from around 3m b/day to just under 1m b/day and, ultimately, nearly half of the workers losing their jobs. Production recovered from the strike but steadily declined over the following ten years, despite the start-up of the new Western Orinoco Belt oil upgrader projects. By the time President Maduro was elected in 2013, production was at 2.7m b/day, the lowest level of production for 20 years (excepting the 2002 strike).

Venezuela oil production



Venezuela oil directed drilling rig count



Source: Bloomberg; Guinness Atkinson Asset Management

The pressures on Venezuela were then compounded by the oil price fall from late 2014, which saw production decline to around 2.4m b/day by 2016. The lack of reinvestment, coupled with a range of US sanctions have made the situation worse since 2016 and has reduced production significantly, falling as low as 0.9m b/day in March 2019 - the lowest level of production from Venezuela for over fifty years.

As a result, the country's income from oil exports has come under extreme pressure. According to OPEC, even in 2017 when Venezuela's production averaged only 2m b/day, oil exports were $31.5bn, representing 98% of overall country exports. Clearly Venezuela has an extreme reliance on its oil industry.

The longer-term decline of production has resulted from mismanagement and underinvestment in the underlying oil fields. Foreign investors in the country have been stung several times. The Venezuelan government partially nationalized the Orinoco projects once they were operating (while also sharply raising royalty rates and income tax rates) and in 2018, PdVSA was sued for non-payment of up to $2bn of unpaid oil service company bills.

Actions such as these have made it unattractive for the international oil industry to invest in projects and this has contributed to the oil directed drilling rig count falling from over 100 rigs in the mid-1990s to only 26 today. Without a pick-up in this kind of investment and activity, there is very unlikely to be a sustained recovery in production anytime soon.

We also note that Venezuela is reported to have borrowed in excess of $20bn from Russia and China in loan for oil deals. Despite the receipt of these loans, investment in the oil fields and production have still suffered and it is questionable whether Venezuela will be able to deliver the oil production that has been marked for loan repayment. If Venezuela defaults badly on these loans, it is also unlikely that Chinese or Russian oil companies would again choose to invest into the country's oil industry, leaving the resource undeveloped.

US sanctions increase the pressure early in 2019

US sanctions against the country have stopped US refiners from buying Venezuelan crude oil and also effectively stopped Venezuela from importing condensate (a light crude oil) that is used to facilitate production of heavy oil from the Orinoco belt fields. Without the condensate, it is difficult to maintain production from heavy oil upgrader facilities.

In January 2019, the US recognized Juan Guaidó (the head of Venezuela's National Assembly) as the country's interim president and ceased to recognize Nicolás Maduro as the president of Venezuela. Alongside this announcement, the US announced further sanctions on PdVSA and these appear to be having a significant near term impact on the country. Most notably, there has been an electricity crisis that has paralyzed most of the country for significant periods of time in recent weeks. One blackout shut down the main oil export terminal and the heavy crude oil processing complex in Jose.

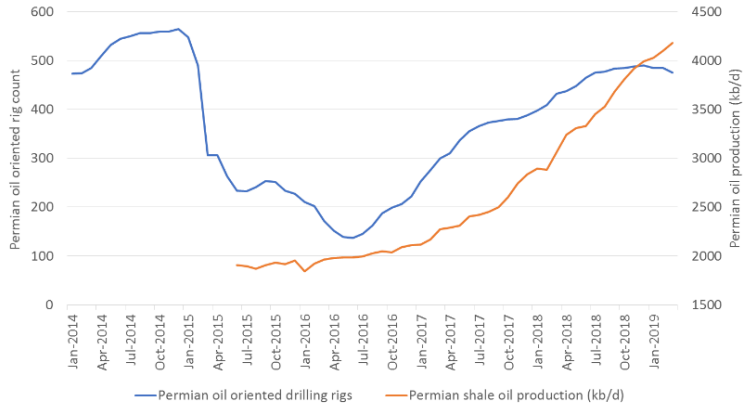
The near-term outlook is pretty dire. Without investment and activity increasing soon, Venezuelan production will continue to remain at low levels and the facilities will suffer long term degradation that will take many years to overcome. Longer term, the global oil industry will want to see a stable economic environment and attractive investment returns before coming back to the country and rebuilding the production infrastructure. At the moment, this seems a long way away.

The US Permian Basin is a large resource witnessing a very different dynamic

We see opposite dynamic happening in the Permian Basin in Texas. Like Venezuela, the Permian Basin is an area that has undergone (and is still undergoing) a significant shift towards unconventional crude oil production. But here, growth has been strong and is, assuming oil prices are high enough, going to continue to be sustained for some years ahead. This last point is important; the underlying production decline rate of the Permian will continue to increase as production grows and the basin is increasingly dependent upon higher and higher levels of activity (and oil price) to keep production growing.

Some history

The Permian Basin, made up of the Delaware and Midland Basins, is located in central and western Texas and southern New Mexico. Conventional oil production started here in the 1920s and peak production was achieved in the early 1970s at around 2m b/day. While conventional production fell until the mid- 2000s (reaching a low of just under 1m b/day), the application of horizontal drilling and fracturing allowed new reservoir horizons to be developed and for production to recover sharply. Since then, the basin has taken the lion's share of US onshore investment and activity (the oil directed drilling rig count in the Permian has increased from 135 rigs in mid-2016 to 475 currently), lifting production to around 4.2m b/day.

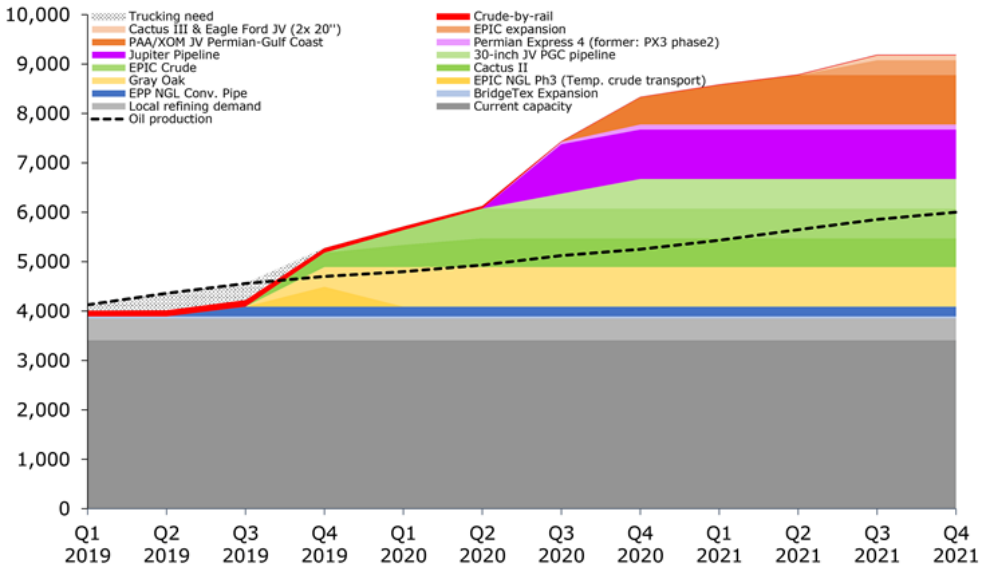


Source: EIA; Guinness Atkinson Asset Management (April 2019)

Infrastructure and pricing

In recent years, oil produced in the Permian has been consumed by refineries in the local area or has been shipped via pipeline north-east to the midcontinent refineries near Cushing, Oklahoma. The rapid growth in Permian production since 2016 has caused the local refineries and the export pipelines to become full, resulting in local prices for Permian oil to become sharply dislocated from other regional and global oil prices. During 2018, the price of oil in the Permian fell to about $47/bl, as a result of the imbalance, when WTI itself was trading at $65/bl and Brent was trading at more than $70/bl.

The large discount (in excess of $15/bl) between Permian oil and WTI only served to increase the industry's desire to build extra export capacity from the region. We now see around 4m b/day of new export pipelines planned from the region, taking total pipeline export capacity to around 8m b/day by the end of 2020. Some of these export capacity increases have started operation over the last few months but we expect a significant increase in capacity start-ups in late 2019. As we see it, this should relieve the near term 'bottleneck' and allow Permian oil prices to track more closely with WTI and Brent. In all likelihood, the industry will have 'overbuilt' on new pipeline capacity and there is likely to be excess spare capacity for some years.



Sources: Rystad Energy; Bloomberg; Guinness Atkinson Asset Management

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We are also seeing a shift of investment from the US super-majors towards the Permian basin plus a switch in industry activity towards larger scale shale developments in the basin (rather than smaller or exploration-oriented activity). The recent strategy presentations of both Exxon and Chevron confirmed the intention of both companies to aggressively pursue growth from the Permian basin:

- Exxon plans to grow production to around 1m boe/day (about 60% oil) by 2024. This production target is up from the previous target and compares to Exxon's Permian production of 0.2m barrels of oil equivalent per day in 2017.
- Chevron plan on taking production from 0.2m boe/day in 2017 to 0.8m boe/day in 2022. This 2022 target was increased from 0.6m boe/day.

That said, growth in the Permian is not a one-way street. Over the last two to three years there has been an aggressive program of 'downspacing', where companies drill more wells in a given area in an attempt to maximize resource extraction. By contrast, there has been increasing talk in the last six months or so around possible well interference (i.e. wells being drilled too close together and therefore cannibalizing each other's production). Mark Papa, ex-CEO of EOG Resources and current CEO of Permian developer Centennial, commented on this last month: "If you look just under the hood, you see that every company has to run faster and faster to achieve growth because you're seeing the effect of geology and well interference that is taking a toll." Papa also concluded: "I'm not proclaiming this to be the end of the shale revolution. It's just that we will have to expect that by 2025 the impact of shale oil from the US will be less powerful than it is today."

Contrasting the outlook for Venezuela and the Permian Basin

Like Venezuela, the Permian basin has significant resource potential which could support a long-term production growth outlook. Unlike Venezuela, the US fiscal, political and economic regime are sufficiently attractive (and the service industry is sufficiently developed) to incentivize upstream investment while the midstream companies are now clearly adding enough pipelines to facilitate the export of the crude oil.

A critical hurdle in the Permian Basin remains, however, with companies needing to invest enough to offset the increasing decline and to deliver top line growth. This is getting more and more difficult every year and will continue to require a higher and higher oil price to incentivize the activity.

In the oil industry, investment capital will typically move to where risk adjusted returns are most attractive. While Venezuela benefited from this in the early 2000s (when the oil majors invested heavily into the Orinoco heavy oil upgraders), it is now the turn of the Permian Basin to be the destination of choice for the industry's capital. While the Permian is benefitting currently, we see that the global oil industry (as a whole) is still reinvesting into new production capacity at a depressed level, as a result of lower oil prices since 2015. While investment into the Permian can generate a fast and short-term oil production response, it will get increasingly difficult for it to keep global oil markets balanced longer term. We expect that higher oil prices will be required to incentivize enough investment in years ahead to keep markets in balance long term and, should the political situation improve in Venezuela, we may even see Venezuela as a recipient of that capital in the longer term.

Performance – Guinness Atkinson Global Energy Fund

The first quarter of 2019 was positive for global equities. Energy equities outperformed as a result of oil prices rising during the quarter. The MSCI World Energy Index (Net Return) was up by 14.4%, outperforming the S&P 500

Index which was up by 13.6%. The Guinness Atkinson Global Energy fund increased by 15.1%, outperforming the energy index by 0.7% and outperforming the broad market (S&P Index) by 1.5%.

Stronger performers included many of our US onshore-oriented E&P and service companies, operationally levered to the improving oil price environment. Devon Energy (+40%), Noble Energy (+33%) and Apache Corp (+33%) were noticeably strong, as would be expected given their relative weakness in the fourth quarter of 2018. On the service side, Helix Energy (+46%) and Schlumberger (+22%) benefitted from the improvement in sentiment towards offshore activity. Internationally, Tullow Oil (+37%) and CNOOC (+22%) reported strong results in the quarter, in addition to their high exposure to oil.

With gas prices in the US and internationally being weak over the quarter, the poorer performing stocks in the portfolio tended to be those more levered to gas rather than oil. In the US, Unit Corp (-0.3%) has a high proportion of its E&P operations directed to gas. In Europe, Equinor (+5%) and Gazprom (+2%) lagged, pulled down by a sharp decline in European gas prices thanks to a seasonal glut of LNG imports.

Within our large cap holdings, US majors (Chevron +14%) performed better than European majors (Shell +8%; Total +6%), a reversal of European major outperformance in 2018.

Performance as of March 31, 2019 (inception date is June 30, 2004)

Inception date 6/30/04	Full Year 2012	Full Year 2013	Full Year 2014	Full Year 2015	Full Year 2016	Full Year 2017	Full Year 2018
Global Energy Fund	3.45%	24.58%	-19.62%	-26.99%	27.04%	-1.06%	-18.92%
MSCI World Energy NR Index	1.87%	18.12%	-11.60%	-22.80%	26.56%	4.97%	-15.84%
S&P 500 Index	15.99%	32.36%	13.66%	1.38%	11.76%	21.82%	-4.37%

Inception date 6/30/04	YTD 2019	1 year	3 year	5 year	10 year
Global Energy Fund	15.11%	-2.77%	4.07%	-8.17%	4.03%
MSCI World Energy NR Index	14.45%	1.84%	6.79%	-3.01%	4.92%
S&P 500 Index	13.65%	9.48%	13.52%	10.90%	15.91%

All returns over 1 year annualized.
Source: Bloomberg
Expense ratio: 1.62% (gross), 1.45% (net)

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 https://www.gafunds.com/our-funds/#fund_performance or call (800) 915-6566.

The Advisor has contractually agreed to reimburse expenses (excluding Acquired Fund Fees and Expenses, interest, taxes, dividends on short positions and extraordinary expenses) in order to limit the Fund's Total Annual Operating Expenses to 1.45% through June 30, 2019. To the extent that the Advisor absorbs expenses to satisfy this cap, it may recoup a portion or all of such amounts absorbed at any time within three fiscal years after the fiscal year in which such amounts were absorbed, subject to the expense cap in place at the time recoupment is sought, which cannot exceed the expense cap at the time of the waiver.

As of April 2018, the MSCI World Energy Index Net Return was used instead of the Gross Return. MSCI World Energy Index Net Return reflects deduction for withholding tax but reflects no deduction for fees and expenses. Net Return is net of local withholding taxes that any investor would typically pay.

Portfolio – Guinness Atkinson Global Energy Fund

In February, the all share acquisition of Newfield Exploration by EnCana Corporation was completed. EnCana is a Canadian listed exploration and production company with onshore assets across North America, including the Permian Basin and the Eagle Ford. The deal, which was announced in early November 2018 (at a time of sharply

falling oil prices and depressed North American E&P equity valuations) adds further diversification to EnCana's onshore operations and provides more options for flexibility in capital allocation. Newfield Exploration's onshore assets were dominated by its 400,000 net acres in the SCOOP/STACK play in the Anadarko Basin but also included stakes in the Bakken and the Uinta Basins.

Sector Breakdown

The following table shows the asset allocation of the Fund at **March 31, 2019**.

(%)	31 Dec 2010	31 Dec 2011	31 Dec 2012	31 Dec 2013	31 Dec 2014	31 Dec 2015	31 Dec 2016	31 Dec 2017	31 Dec 2018	31 Mar 2019
Oil & Gas	**93.2**	**98.5**	**98.6**	**95.6**	**95.3**	**94.4**	**97.9**	**97.7**	**98.6**	**97.6**
Integrated	41.2	39.6	39.1	39.6	37.5	40.5	45.8	41.8	45.3	44.5
Exploration and production	36.9	41.5	41.6	36.8	38.1	37.0	37.3	38.0	35.9	36.3
Drilling	6.3	6.0	7.4	6.8	3.1	1.7	2.3	1.8	1.5	1.3
Equipment and services	5.3	6.6	7.1	9.0	13.1	11.1	8.9	9.2	8.3	8.5
Storage & transportation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	3.7	3.4
Refining and marketing	3.5	4.8	3.4	3.4	3.5	4.1	3.6	3.5	3.9	3.6
Coal and consumables	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Solar	**3.2**	**1.2**	**1.2**	**2.8**	**3.5**	**4.9**	**1.0**	**2.1**	**0.6**	**0.7**
Construction and engineering	**0.4**	**0.4**	**0.6**	**0.9**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Cash	**3.2**	**-0.1**	**-0.4**	**0.7**	**1.2**	**0.7**	**1.1**	**0.2**	**0.8**	**1.7**
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Guinness Atkinson Asset Management
Basis: Global Industry Classification Standard (GICS
Holdings are subject to change at any time

Guinness Atkinson Global Energy Fund Portfolio

Based on the information shown previously, the table below shows the fund valuation in terms of historical and forward (analyst consensus estimates from Bloomberg) price/earnings (P/E) ratios versus the S&P500 Index.

	2012	2013	2014	2015	2016	2017	2018	2019
Fund P/E	7.6	8.1	8.6	20.6	37.9	22.1	12.5	13.3
S&P 500 P/E	29.3	26.4	24.0	28.2	26.7	22.8	18.7	17.1
Premium (+) / Discount (-)	-74%	-69%	-64%	-27%	42%	-3%	-33%	-22%
Average oil price (WTI $)	$94/bbl	$98/bbl	$93/bbl	$48/bbl	$43/bbl	$51/bbl	$65/bbl	

Source: Standard and Poor's; Guinness Atkinson Asset Management Ltd
Forecasts are inherently limited and cannot be relied upon. Holdings are subject to change.

Portfolio Holdings

Our integrated and similar stock exposure (c.46%) is comprised of a mix of mid cap, mid/large cap and large cap stocks. Our four large caps are Chevron, BP, Royal Dutch Shell and Total. Mid/large and mid-caps are ENI, Equinor and OMV. As of March 31, 2019 the median P/E ratios of this group were 12.2x/11.9x 2018/2019 earnings. We also have two Canadian integrated holdings, Suncor and Imperial Oil. Both companies have significant exposure to oil sands in addition to downstream assets.

Our exploration and production holdings (c.37%) 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 have a bias towards the US (EnCana, Devon and Oasis), with five other names (Apache, Occidental, ConocoPhillips, Noble Energy, Anadarko) having a mix of US and international production and one (Tullow) which is African focused. One of the key metrics behind a number of the E&P stocks held is low enterprise value / proven reserves. Almost all of the US E&P stocks held also provide exposure to North American natural gas.

We have exposure to four (pure) emerging market stocks in the main portfolio, though one is a half-position, and in total represent 12% of the portfolio. Two are classified as integrateds (Gazprom and PetroChina) and two as E&P companies (CNOOC 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 2.9x 2019 earnings. PetroChina is one of the world's largest integrated oil and gas companies and has significant growth potential and, alongside CNOOC, enjoys advantages as a Chinese national champion. SOCO International is an E&P company with production in Vietnam.

The portfolio contains one midstream holding, Enbridge, North America's largest pipeline company. With the growth of onshore oil and gas production expected in the US and Canada over the next five years, we believe Enbridge is well placed to execute its pipeline expansion plans.

We have useful exposure to oil service stocks, which comprise around 10.4% of the portfolio. The stocks we own are split between those which focus their activities in North America (land driller Unit Corp) and those which operate in the US and internationally (Helix, Halliburton and Schlumberger).

Our independent refining exposure is currently in the US in Valero, the largest of the US refiners. 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.

GUINNESS ATKINSON FUNDS

Portfolio as of March 31, 2019

Guinness Atkinson Global Energy Fund 31 March 2019			2012	2013	2014	2015	2016	2017	2018	2019
Stock	Curr.	% of NAV	B'berg mean PER	B'berg mean PER	B'berg mean PER	B'berg mean PER	B'berg mean PER	B'berg mean PER	B'berg mean PER	B'berg mean PER
Integrated Oil & Gas										
Chevron	USD	3.74	10.0	11.1	12.8	33.9	88.8	29.7	15.3	18.1
Royal Dutch Shell PLC	EUR	3.73	7.5	9.9	8.7	18.4	30.3	16.4	12.2	11.7
BP PLC	GBP	3.95	8.0	10.0	11.8	20.8	39.9	23.8	12.3	13.5
Total SA	EUR	3.61	9.2	10.3	10.4	13.4	15.8	14.8	11.1	10.5
ENI SpA	EUR	3.89	7.9	12.6	14.6	68.3	nm	27.6	13.1	12.8
Equinor ASA	NOK	3.84	7.4	9.0	12.5	30.7	155.9	16.3	10.9	12.0
OMV AG	EUR	4.15	10.6	13.0	16.0	14.3	14.7	9.8	10.1	9.5
		26.91								
Integrated Oil & Gas - Canada										
Suncor Energy Inc	CAD	3.74	13.5	13.6	13.5	38.5	nm	23.2	15.5	15.8
Canadian Natural Resources Ltd	CAD	3.69	23.1	16.4	10.7	264.0	nm	31.3	13.1	16.1
Imperial Oil	CAD	3.45	8.8	11.4	9.6	20.5	60.6	28.5	13.3	14.4
		10.88								
Integrated Oil & Gas - Emerging market										
PetroChina Co Ltd	HKD	3.54	6.7	7.4	7.3	22.7	89.0	34.6	14.0	13.4
Gazprom OAO	USD	3.40	3.0	2.7	4.6	2.8	4.0	4.5	2.7	2.9
		6.94								
Oil & Gas E&P										
Apache Corp	USD	3.52	3.6	4.3	6.2	nm	nm	327.0	20.7	40.3
Anadarko Petroleum Corp	USD	3.25	13.6	11.0	9.9	nm	nm	nm	18.3	25.8
Occidental Petroleum Corp	USD	3.42	9.5	9.5	11.4	398.8	nm	73.7	13.4	19.4
ConocoPhillips	USD	3.36	11.7	11.9	12.6	nm	nm	107.1	15.0	18.6
Devon Energy Corp	USD	3.76	9.8	7.4	6.1	12.8	nm	17.2	20.9	21.2
Noble Energy Inc	USD	3.66	10.8	8.0	10.6	433.9	nm	1,545.6	25.6	196.3
EnCana Corp	USD	3.31	4.2	5.7	3.5	nm	302.0	13.1	8.1	7.8
Oasis Petroleum Inc	USD	1.12	5.3	2.9	3.2	9.9	nm	nm	28.0	27.3
		25.41								
International E&P										
CNOOC Ltd	HKD	3.93	8.7	8.8	10.6	31.6	nm	18.3	10.3	10.8
Tullow Oil PLC	GBP	2.21	4.8	36.2	nm	nm	nm	16.4	28.4	11.1
Soco International PLC	GBP	1.24	1.3	1.4	2.1	nm	nm	nm	27.2	16.9
		7.37								
Midstream										
Enbridge Inc	USD	3.44	38.7	35.7	32.7	29.6	27.4	33.2	24.1	25.5
		3.44								
Drilling										
Unit Corp	USD	1.34	3.4	3.9	3.3	nm	nm	26.8	14.3	13.7
		1.34								
Equipment & Services										
Halliburton Co	USD	3.16	9.9	9.5	7.4	19.8	nm	25.2	15.9	21.5
Helix Energy Solutions Group Inc	USD	1.83	4.3	7.4	4.1	46.8	nm	nm	36.0	30.5
Schlumberger	USD	3.40	10.4	9.2	7.9	13.0	37.7	29.8	26.8	27.4
		8.39								
Solar										
SunPower Corp	USD	0.75	43.4	4.6	5.0	3.3	nm	nm	nm	nm
		0.75								
Oil & Gas Refining & Marketing										
Valero Energy Corp	USD	3.56	17.4	20.7	13.9	9.7	23.1	17.4	13.8	12.1
		3.56								
Research portfolio										
Cluff Natural Resources PLC	GBP	0.66	nm	nm	nm	nm	nm	nm	nm	nm
EnQuest PLC	GBP	0.98	1.1	1.3	2.3	22.6	1.5	nm	5.0	3.7
JKX Oil & Gas PLC	GBP	0.95	2.7	5.2	14.3	nm	nm	nm	35.7	23.8
Ophir Energy PLC	GBP	0.19	nm	nm	1.3	nm	nm	nm	nm	15.3
Reabold Resources PLC	GBP	0.35	nm	nm	nm	nm	nm	nm	nm	nm
Shandong Molong Petroleum Machinery Co Ltd	HKD	0.16	nm	nm	nm	nm	nm	nm	nm	nm
		3.29								
		1.74								
		100								
Research holding			7.1	7.8	8.3	21.3	35.2	22.8	12.8	13.4

The Fund's portfolio may change significantly over a short period of time; no recommendation is made for the purchase or sale of any particular stock.
Forecasts are inherently limited and cannot be relied upon. Holdings are subject to change.

The Fund's investment objectives, risks, charges and expenses must be considered carefully before investing. The statutory and summary prospectuses contain this and other important information and can be obtained by calling 800- 915-6565 or visiting www.gafunds.com. Read and consider it carefully before investing.

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

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

MSCI World Index is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed markets.

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.

The Henry Hub pipeline is the pricing point for natural gas futures on the New York Mercantile Exchange.

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

The New York Mercantile Exchange is the world's largest physical commodity futures exchange.

Enterprise Value, or EV for short, is a measure of a company's total value, often used as a more comprehensive alternative to equity market capitalization

Standard Deviation (SD) is applied to the annual rate of return of an investment to measure the investment's volatility. Standard deviation is also known as historical volatility and is used by investors as a gauge for the amount of expected volatility.

Debt/EBITDA is a measure of a company's ability to pay off its incurred debt. This ratio gives the investor the approximate amount of time that would be needed to pay off all debt, ignoring the factors of interest, taxes, depreciation and amortization.

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

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