

REPORT HIGHLIGHTS

OIL

Brent/WTI recovery as OPEC+ attempt to balance the market

Oil prices recovered over the quarter from extreme lows. The Brent oil price started the quarter at \$22/bl and, after a very volatile April, rose steadily through May and June close the period at around \$40/bl. Movements in the WTI oil price were even more pronounced, the price falling in negative territory (-\$38/bl on April 20) for the first time in oil market history. WTI also then recovered, closing June at \$38/bl.

NATURAL GAS

US price rises slightly; European and Asian gas prices weaker

The US natural gas price opened April at \$1.64/mcf (1,000 cubic feet), and traded up over the quarter to \$1.75/mcf. European and Asian gas prices slipped to around \$2/mcf, hit by the combined impact on demand of a very warm northern hemisphere winter and COVID-19 related economic slowdown.

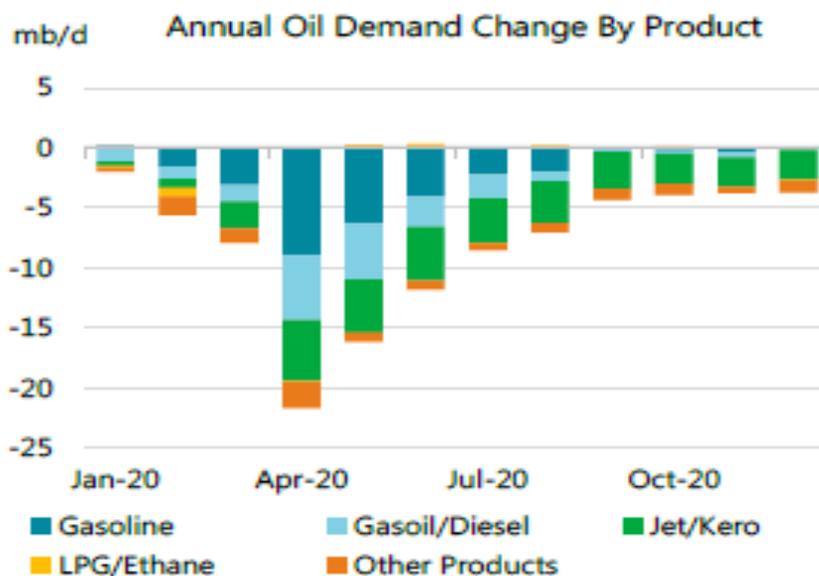
EQUITIES

Energy underperforms the broad market over the quarter

The MSCI World Energy Index (net return) rose by 16.6% in the second quarter, underperforming the MSCI World Index (net return) which rose by 19.4% over the month (all in US dollar terms).

CHART OF THE QUARTER – Demand down 16m b/day in the second quarter of 2020

Global oil demand was down by around 16m b/day during the second quarter, bringing demand for the first half of 2020 down by around 10m b/day versus 2019. The IEA are expecting average demand in the second half of the year to be down on average by around 5m b/day, a forecast which relies on no major lockdown recurrence around the world.



Source: IEA; Guinness Atkinson Asset Management

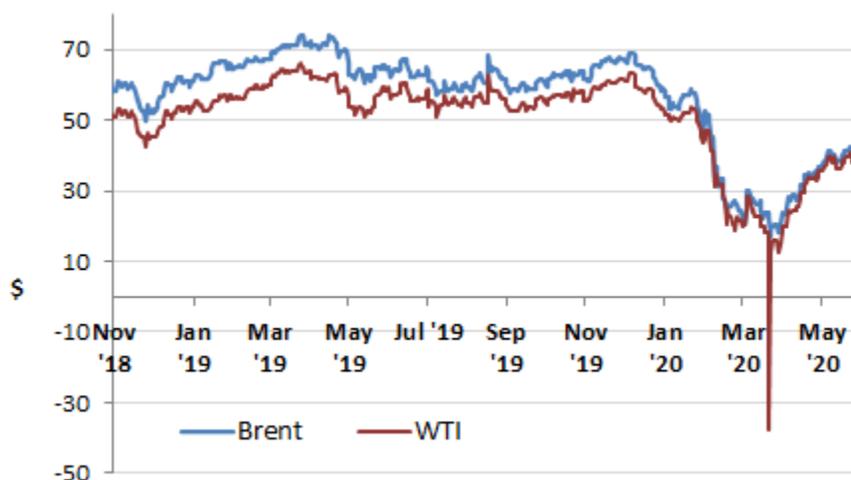
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1. Second Quarter 2020 in Review

i) Oil market

Figure 1:
 Oil price (WTI and Brent \$/barrel) 18 months
 December 31, 2018 to June 30, 2020



Source: Bloomberg LP

The West Texas Intermediate (WTI) oil price opened the quarter at \$20.1/bl. For technical reasons, in the last hours before the May WTI contract expired, the WTI price fell below zero for the first time in history, dropping on April 20 as low as -\$37.6/bl, before recovering the next day to \$10.0/bl. WTI then staged a partial recovery, finishing April at \$18.8/bl. Over May and June, WTI generally traded higher, closing the quarter at \$39.3/bl. WTI has so far averaged \$37/bl in 2020, having averaged \$58/bl in 2019, \$65/bl in 2018 and \$51/bl in 2017.

Brent oil traded in a similar shape (albeit without the extreme volatility and negative short-term pricing), opening the quarter at \$21.5/bl and recovering to close June at \$40.1/bl. Brent has averaged \$40/bl so far in 2020, having averaged \$64/bl in 2019 and \$72/bl in 2018. The gap between the WTI and Brent benchmark oil prices widened slightly over the month, ending June at around \$2/bl, versus over \$4/bl on average in 2020.

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

- **Large oil and product inventory builds**

OECD total product and crude inventories at the end of May (latest data point) were estimated by the IEA to be 3,180m barrels, up by 192m barrels versus the level reported for March. This compares to a 10-year average increase for April and May of 47m barrels, implying that the market was heavily oversupplied. The significant oversupply situation has pushed OECD inventory levels close to maximum capacity (c3.3m barrels), though the situation appears to have moderated in June.

- **Extreme oil demand contraction caused by global reaction to the coronavirus**

The global oil demand picture remains fluid, but the IEA estimate that demand contracted in April, May and June by 23m b/day, 18m b/day and 13m b/day respectively. Jet fuel and kerosene remains the worst hit sector, with demand down by around 60% versus the same time last year – unsurprising given the extreme weakness of the aviation industry. The IEA's current estimate of full-year oil demand decline is around 8m b/day, implying 2H 2020 demand down by around 6m b/day.

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

- **OPEC+ production cuts**

In the face of extreme market oversupply, OPEC+ confirmed a deal in early April to cut their production by 9.7m b/day, relative to their "baseline" production level of October 2018. The production cuts started in May. Initial estimates for June suggest that there has been strong compliance, with pressure on laggard countries (notably Iraq) bearing fruit. According to Bloomberg estimates, OPEC-10 production averaged around 22m b/day in June, compared to around 28m b/day at the start of the year. Production cuts from Saudi have been particularly large, as they enact a voluntary temporary reduction in excess of their formal quota.

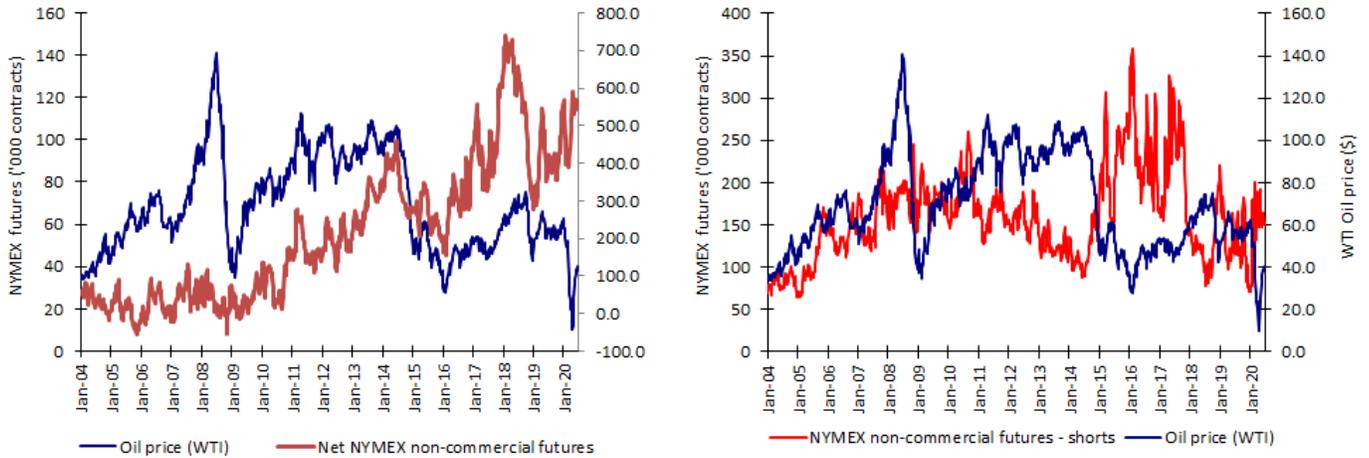
- **Continued disruption in Libya**

Small in the context of the coronavirus disruption, but Libyan oil production continues to be heavily disrupted. Production in June is estimated to have been around 0.1 m b/day, which compares to a normal production level of around 1m b/day. The disruption is political in nature, and we would expect a full recovery of Libyan exports when these political issues are resolved.

Speculative and investment flows

The New York Mercantile Exchange (NYMEX) net non-commercial crude oil futures open position was 561,000 contracts long at the end of June versus 543,000 contracts long at the end of May. 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 fell to 150,000 contracts at the end of June versus 159,000 at the end of the previous month.

Figure 2:
NYMEX Non-commercial Net and Short Futures Contracts: WTI
 January 2004 – June 2020

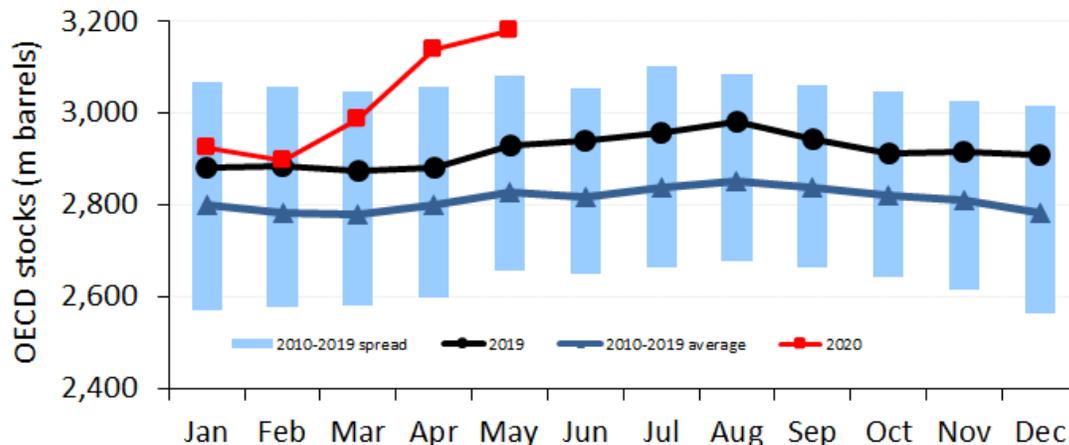


Source: Bloomberg LP/NYMEX/ICE (2020)

OECD stocks

OECD total product and crude inventories at the end of May (latest data point) were estimated by the IEA to be 3,180m barrels, up by 43m barrels versus the level reported for April. This compares to a 10-year average increase for May of 27m barrels, implying that the market was oversupplied (though less so than April). The significant oversupply situation currently developing via the coronavirus crisis likely sees oil and refined products pushing against maximum inventory levels (c3.3bn barrels) over the next couple of months.

Figure 3:
OECD Total Product and Crude Inventories, Monthly
 2004 to 2020



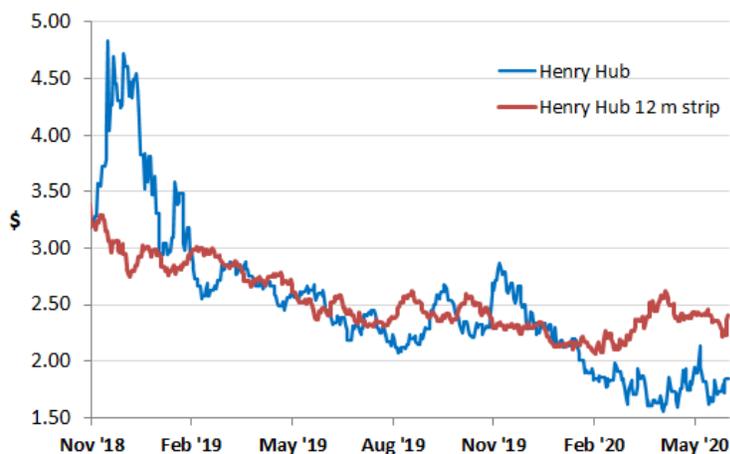
Source: IEA Oil Market Reports (June 2020 and older)

ii) Natural gas market

The US natural gas price (Henry Hub front month) opened April at \$1.64/mcf (1,000 cubic feet), and generally traded in a range between \$1.60 and \$2.00/mcf, closing at \$1.75/mcf. The spot gas price has averaged \$1.80/mcf so far in 2020, having averaged \$2.53/mcf in 2019, \$3.07 in 2018 and \$3.02 in 2017.

The 12-month gas strip price (a simple average of settlement prices for the next 12 months' futures prices) also rose over the quarter, opening at \$2.22/mcf and closing at \$2.41 /mcf. The strip price averaged \$2.60 in 2019, having averaged \$2.90 in 2018 and \$3.12 in 2017.

Figure 4:
Henry Hub Gas Spot Price and 12m Strip (\$/Mcf) 18 months
December 31, 2018 to June 30, 2020



Source: Bloomberg LP

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

- **Decrease in US onshore natural gas production**

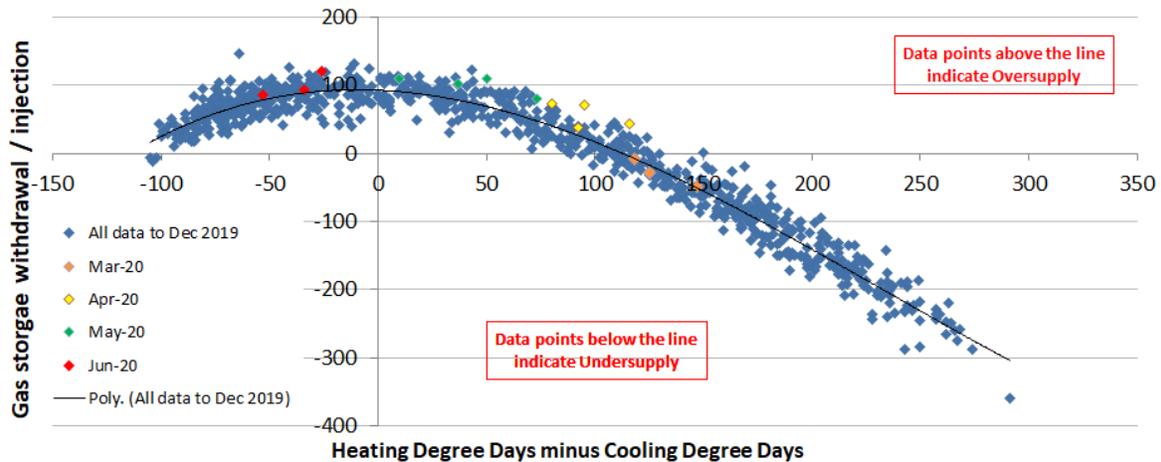
Onshore US natural gas production averaged 100.4 Bcf/day in April 2020 (the latest available data point), down by 2.2 Bcf/day versus the level reported for March. The decline was particularly acute in associated gas production, a by-product of shale oil production, given a spike in the number of shale oil wells being shut-in during April. On average, 1m b/day of US shale oil production brings around 2.5 Bcf/day of associated gas, so a 2m b/day oil decline would mean gas supply falling by 5 Bcf/day - representing around 5% of the US market. Despite the sharp fall in April, onshore gas production remains around 5 Bcf/day higher than a year ago.

Factors which weakened the US gas price in June included:

- **Inventories above the ten-year average, as demand dips**

Inventories of natural gas in the US rose sharply over the quarter, as COVID-19 related “lockdowns” caused natural gas demand to drop across the country, particularly in the commercial sector. By the end of the quarter, natural gas in storage had risen to 3.0 Tcf, 23% higher than the ten-year average (2.5 Tcf). Weather adjusted inventory data suggests that the market was oversupplied in June by an average of 3 Bcf/day.

Figure 5:
 Weather adjusted US natural gas inventory injections and withdrawals

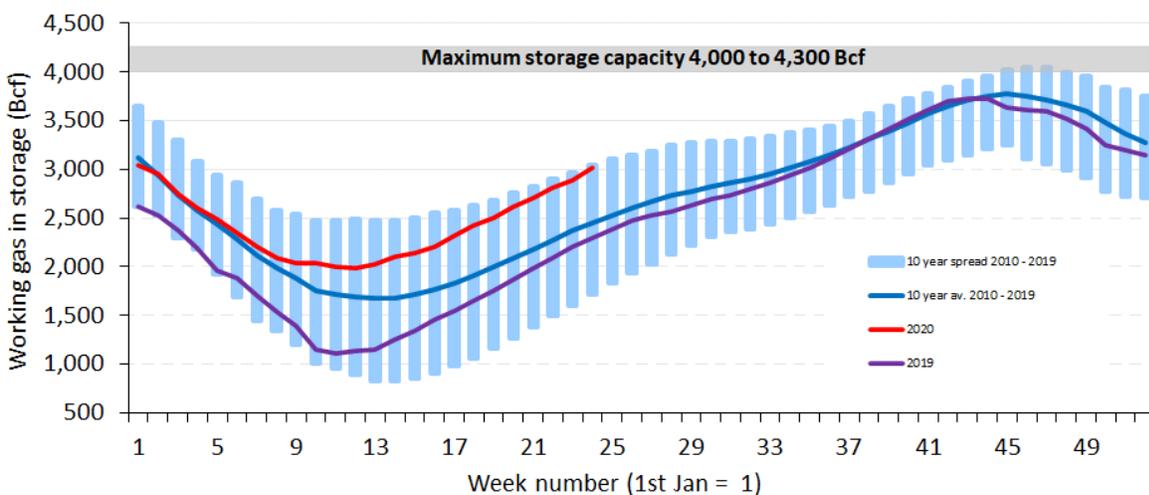


Source: Bloomberg LP; Guinness Atkinson Asset Management

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 June were reported by the EIA to be 3.0 Tcf. Current gas in storage is around 0.5 Tcf above the 10-year average, thanks to COVID-19 mitigation measures dampening demand. The high visibility of low-cost supply growth kept a cap on prices in 2019 despite the fact that inventories have spent much of the year below the 10-year average level.

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



Source: Bloomberg; EIA (July 2020)

2. Managers Comments

Review of 1H 2020

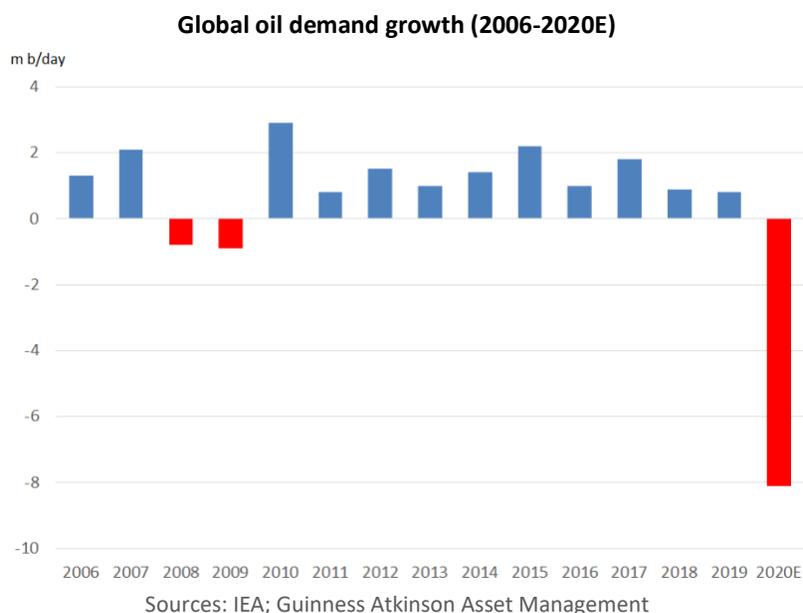
The first half of 2020 provided a series of events that can reasonably be described as the biggest oil shock in living memory. OPEC started the year with a cut in production quotas of just over 1m b/day, which they anticipated would be needed in 2020 to keep markets balanced. The scale of the demand contraction caused by the COVID-19 crisis, compounded for a short period by a sharp ramp in OPEC+ production, then created an unprecedented supply surplus. At the most extreme point in April, this sent the WTI oil price negative. There followed an aggressive and coordinated response from OPEC+ to bring the oil market back into balance.

Here, we explore the key developments in oil and gas markets over the period, the impact on energy equities, and the outlook.

Oil Demand: An Implosion

Global oil demand in the first half of 2020 is estimated to have contracted by around 11m b/day, thanks to the spread of COVID-19 mitigation measures initially in China, then around the world. At the most acute points of the crisis, in April, it was reported that 118 countries, representing 92% of global GDP, had enacted some form of social distancing. As a result, transportation took a disproportionate hit. Oil demand in April is estimated to have been down by nearly 22m b/day, then down 19m b/day in May and around 13m b/day in June. Not surprisingly, the jet fuel and kerosene demand sector, serving the aviation industry, has seen the sharpest decline. Jet fuel demand in the second quarter of 2020 is estimated to have declined by 62%, compared to total oil demand down by around 18% over this period.

Building an accurate view of annual global oil demand for 2020 depends of course on the path of the COVID-19 crisis, and that is unknowable. But at this stage, it is hard to build a picture that doesn't see 2020 demand down by at least 8m b/day. By comparison, global oil demand contracted by around 1m b/day in each of 2008 and 2009, before bouncing by nearly 3m b/day in 2010.



The IEA have recently published an initial estimate for 2021 oil demand, forecasting a rise of 5.7m b/day versus 2020. However, this would still leave demand over 2m b/day lower than 2019, mostly because of ongoing weakness in jet fuel and kerosene demand.

OPEC supply: price war gives way to price support

OPEC, plus non-OPEC partners, met in early March with the key discussion point being a response to falling oil demand as a result of the spread of COVID-19. Despite Saudi's proposal for a further quota cut, negotiations with Russia quickly broke down and the meeting concluded with no agreement around an extension to production quotas, and an abandonment of existing quotas. OPEC chose to "punish" Russia by promising a significant spike in output for April, the scale of which would normally be enough alone to create significant downward pressure on the oil price. As it happened, April's excess production (c2.5m b/day) came at the peak of the COVID-19 demand shock, creating oversupply picture in excess of 20m b/day.

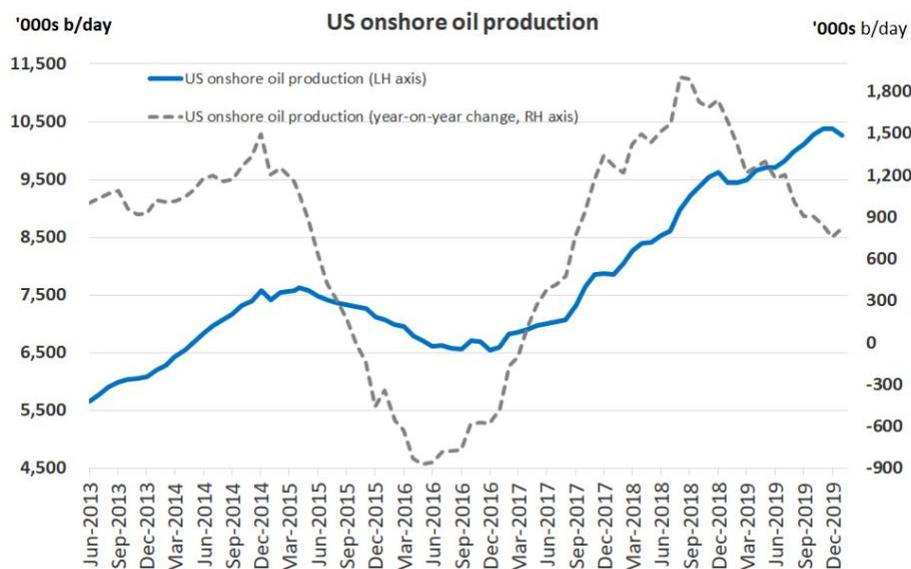
By April, it quickly became apparent that OPEC's actions were unsustainable, and all parties involved in the OPEC+ agreement, plus some additional non-OPEC partners, were forced back into negotiation. A deal was struck on April 12th for OPEC+ to cut their production by 9.7m b/day, representing a 23% cut to the baseline production level of October 2019. Given the number of countries involved, the April deal was a more complex agreement than anything that OPEC has delivered historically. The duration of the agreement was also impressive; OPEC+ have agreed to a headline cut of 9.7m b/day for two months, then 7.7m b/day for six months and a further 5.7m b/day for sixteen months. This is longer and larger in duration than most had been expecting. While not enough to stave off significant inventory builds in the second quarter, it gave us confidence that the organization has a strong desire to support prices through a potentially extended period of demand loss. It will lessen the inventory overhang for the second half of 2020 and 2021 and is helping to accelerate the pace of oil market rebalancing.

Non-OPEC supply: survival of the fittest

2020 was initially a year of production growth expected for non-OPEC, led by large project completions in Norway and Brazil. The very sharp fall in oil prices changed that landscape rapidly, with non-OPEC declines coming through in April and May to complement the commitments made by OPEC. In May, for example, the US shut-in around 1.5m b/day of production.

The fall in oil prices has created a two-fold response from non-OPEC producers: one driven by geology and the other investment led. The geology behind onshore conventional oil is such that oilfield pressure tends to degrade when production is shut in. The fields most affected are likely to be mature, depleted and heavier/sourer reservoirs in places like the US, Canada, Russia and Latin America. The scale of permanent production loss looks to be around 1m b/day.

For US shale oil, there is less risk of permanent damage from production shut-ins, but the fall in capital expenditure by US E&P companies, when combined with high natural decline rates, will result in a meaningful throttling of production, beyond temporary shut-ins.



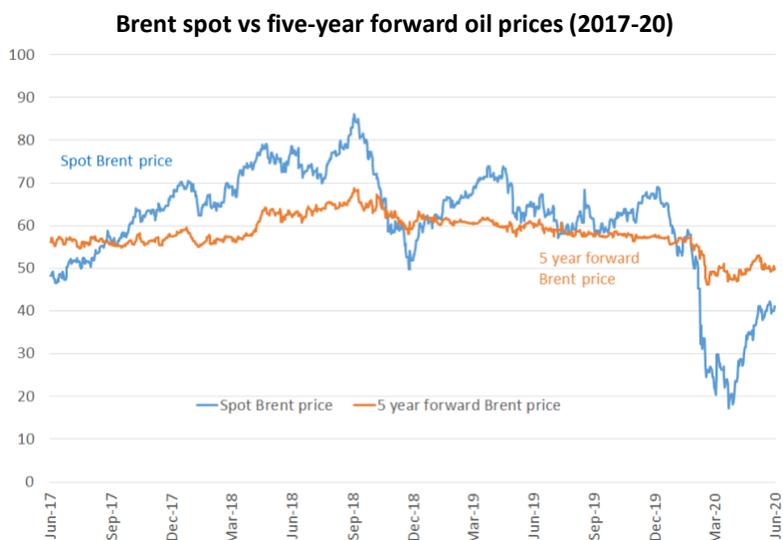
Source: EIA; Guinness Atkinson Asset Management

In the 2015/16 period, when oil prices fell from \$100/bl to \$50/bl, total US onshore production declined by 1m b/day (15%). The subsequent rapid rebound in production post 2016 was achieved thanks to equity and debt markets that kept on giving. The same is not true today, and even in the run-up to March’s oil price collapse, producers were showing better (or forced) capital discipline that was already slowing supply. The downcycle doesn’t spell the end of US shale, but production declines will only cease with WTI back above \$50/bl. Overall, non-OPEC supply is expected to fall by just over 3m b/day in 2020.

Oil prices

Thanks to the events described above, spot oil prices were exceptionally volatile during the first half of 2020. Brent started the year at \$66/bl, drifted lower over January and February towards \$50/bl, before dropping precipitously following the OPEC meeting in early March. The Brent spot price dropped to a low of \$19/bl on April 21, before recovering steadily through May and June to close the period at around \$40/bl. Brent spot has averaged \$42/bl so far this year. The five-year forward Brent price opened the year at \$57/bl and dropped to a low of \$46/bl in March, before recovering by the end of June to \$50/bl.

The ride in WTI oil prices was even more volatile, with the structure of forward settlements contributing to WTI spot dislocating from Brent and turning negative for the first time, falling to -\$38/bl on April 20. WTI spot ultimately recovered to \$39 by the end of June. The WTI futures curve also fell over the period, with the five-year forward WTI price declining from \$52/bl to \$45/bl.



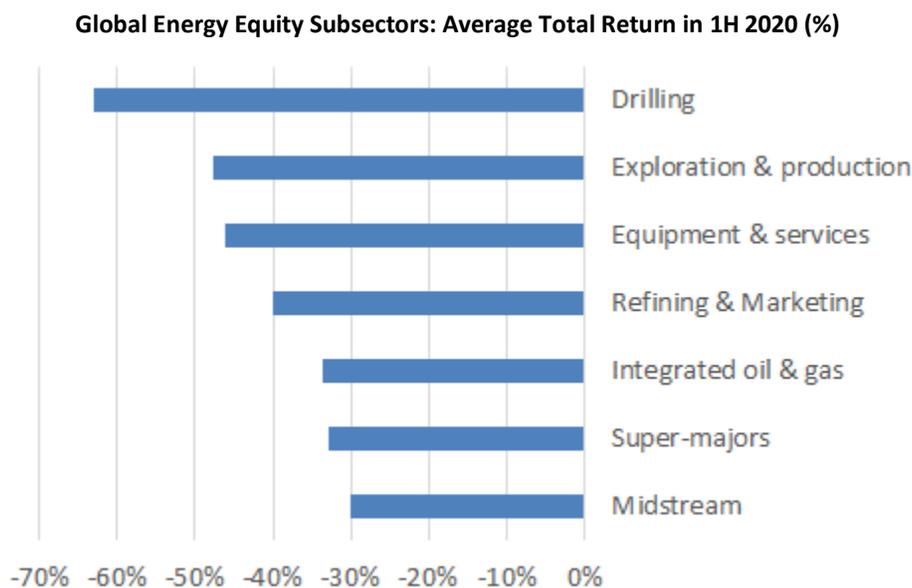
Source: Bloomberg

Natural gas

For natural gas, 2020 has so far been a year of weak prices across the globe, as COVID-19 related demand impact arrived on the back of a warm northern hemisphere winter, which left gas in storage already at elevated levels. The US gas price (Henry Hub) averaged \$1.81/mcf in 1H 2020, with surplus gas being pushed into inventories. One silver lining for the US gas market has been a fall in associated gas supply from the US shale oil producers, given the shut-ins seen in that industry. But against this, there has been a fall in exports of US gas via LNG, given European and Asian gas prices (both hovering around the \$2/mcf for much of the last few months) being too low to incentivize the trade.

Energy equities

Given the weakness in oil and gas prices, it has been an extremely challenging period for energy equities. The sector (MSCI World Energy Index) finished -35.7%, behind the broad market (MSCI World -5.8%). As ever, the performance of the MSCI World Energy Index was only part of the story, with 2020 seeing small and mid-cap sectors generally underperforming large cap (as exemplified by the MSCI Energy Small Cap Index returning -46.5% over the period). Key subsector performance is summarized in the following chart:



Source: Bloomberg; Guinness Atkinson Asset Management

A quick tour of some of the main energy sub-sectors paints a picture for the overall performance of energy equities:

- **Integrated oil and gas companies** suffered severe challenges and underperformed the broader equity market, but again delivered above average performance within the energy sector, thanks to their diversified business models and large balance sheets. Among the super-majors, Royal Dutch Shell took the notable decision to cut its ordinary dividend for the first time since 1940. The other four super-majors have maintained their dividends for the time being, though BP’s share price suggests a cut is expected later this year. Emerging Market integrated companies generally outperformed the developed market integrations, and all were strong versus other subsectors.
- **Midstream companies** were also a relative safe haven within the energy sector. Production shut-ins across North America, coupled with a slowdown in investment activity, raised some fears about the sustainability of earnings for the midstream industry, explaining its underperformance versus the broader equity market. However, midstream earnings still look more resilient than most other energy subsectors, hence relative outperformance within energy.

- **Oil refiners** were hit by the collapse in oil demand seen around the world, owing to COVID-19 mitigation measures. Crack spreads since March has been exceptionally weak, and although refining equities recovered somewhat in the second quarter, the specter of working off large refined product inventories hangs over the sector.
- **Exploration and production companies** were generally very weak, though gas-oriented producers fared better. The worst returns were delivered from the North American onshore E&P sector, with higher cost oil producers in Canada and the United States most exposed to the drop in WTI oil prices (and associated regional benchmarks). A number of higher-cost, highly levered E&Ps have now filed for bankruptcy, including former shale “darling” Chesapeake. Natural gas producers enjoyed a better time, as the fall in associated gas from shale oil operations promises a more balanced gas market in 2021.
- **Energy services (drilling and equipment & services)** were at the sharp end of the downturn, hit by the severe slowdown in operating activity in the short-term and drying up of capex budgets longer term. Large cap diversified service providers (Halliburton, Schlumberger and Baker Hughes) were not immune from the sell-off, falling over the period by 39%-53%, whilst onshore North American service providers tended to be weakest.

Outlook

As we look ahead into the second half of 2020, OPEC+’s task is to be dynamic with supply, reacting to a recovery in oil demand that is likely to be erratic, as restrictions on movement in different countries and regions come and go. Longer term, once the COVID-19 crisis passes, there is the question of where oil prices settle back to. We approach this by considering the likelihood of various price levels:

- Oil prices at \$30/bl.** Technically, this is a price level that Russia could sustain for a period, given their sovereign wealth reserves that were built up when prices were higher. But the list of reasons for oil at \$30/bl essentially stops there. It is a price that would cause financial distress for Saudi (they would run an 18% budget deficit in 2020 at this price, and the \$/Riyal peg likely gets quickly pressurized) and other OPEC members; it would eventually break Russia; it would cause US shale oil supply to fall sharply and remain in decline; other non-OPEC supply would decline; and post COVID-19, there would be a strong demand stimulus thanks to low price. So, we do not see prices settling longer-term at this level.
- Oil prices at \$45-50/bl.** Russia has an estimated fiscal breakeven oil price of \$45/bl, so this price level is likely sustainable for them longer term. We expect that it would also cause non-OPEC supply to stagnate, allowing OPEC barrels which are currently on the sidelines (Venezuela and Iran) back into the market. Against this, it is still a price that is fiscally uncomfortable for nearly all OPEC members, including Saudi, even assuming a higher level of market share.
- Oil prices at \$60/bl+.** An oil price at this level would be preferable for Saudi and other members of OPEC. Pre COVID-19 crisis, it is arguable that a price much above \$60/bl would still incentivize too much non-OPEC supply growth. There is a school of thought now, though, that the structural damage to non-OPEC supply through the COVID-19 episode will be sufficient to put OPEC back in control over the market. As Goldman

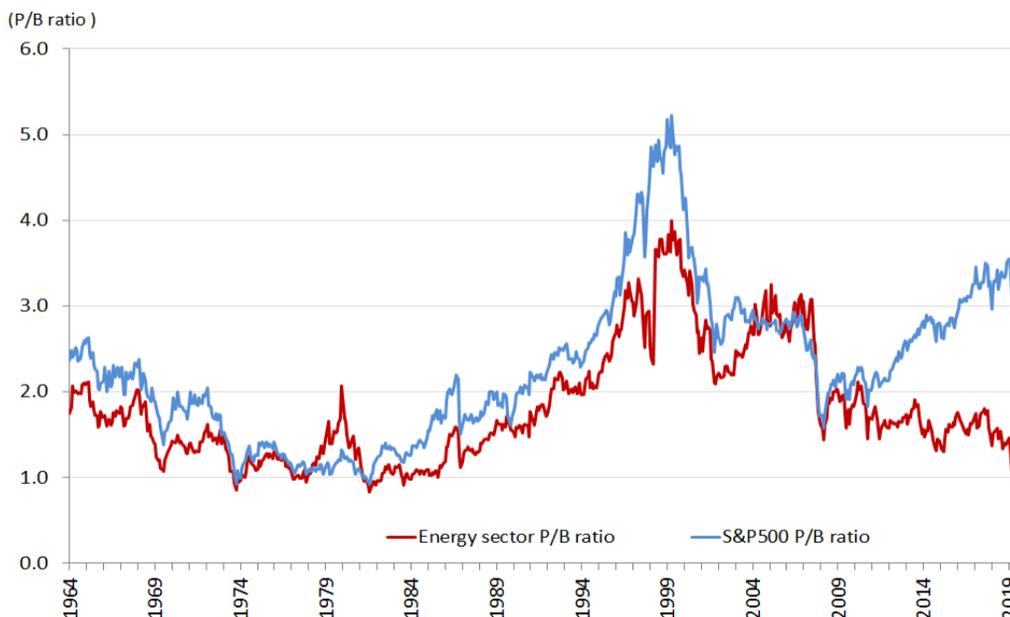
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Sachs describe it, “paradoxically, the demand shock could ultimately create an inflationary oil supply shock of historic proportions because so much oil production will be forced to be shut in”.

Whether the price settles back at \$45-50/bl or \$60+/bl depends largely on the impairment to non-OPEC supply that occurs this year, and the access to capital for US shale in the future. If non-OPEC supply sustains reasonably, then OPEC may have to settle for \$45-50/bl. But if non-OPEC supply is held back, then the door opens for OPEC to take control of the market again, as they did for much of the 1998-2008 period.

The heavy fall in crude prices last quarter has been accompanied by sharp declines in oil equities, as the market adjusts to the lack of support for oil prices. The fall in energy equities pushed the price-to-book ratio for the energy sector below 1x for the first time since the mid-1980s, falling as low as 0.7x in mid-March. There has been a muted recovery since then, but the sector P/B ratio at the end of June remains at 1.0x, versus the S&P 500 trading at over 3.5x. On a relative price-to-book (P/B) basis (versus the S&P500), therefore, the valuation of energy equities has fallen back to a 50-year low, at 0.3x.

Price to book ratio of S&P 500 vs energy sector (December 31, 1965 – June 30, 2020)



Sources: Bernstein; Bloomberg; Guinness Atkinson Asset Management

Energy sector is MSCI World Energy Index from December 31, 1995, and basket of large-cap energy stocks for the period December 21, 1965 to December 31, 1995

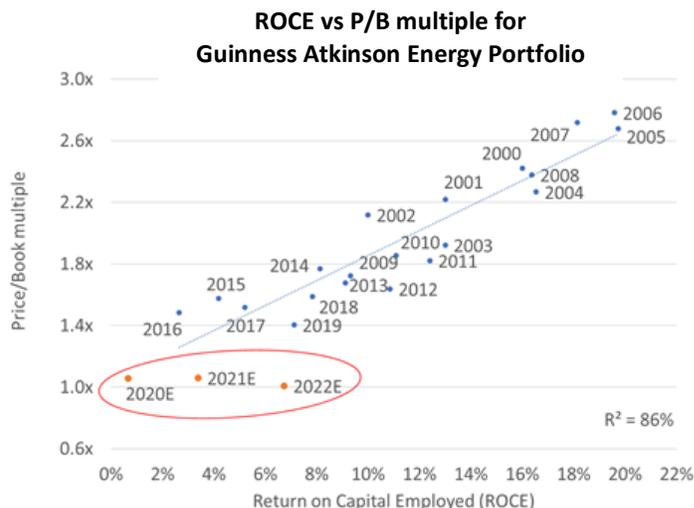
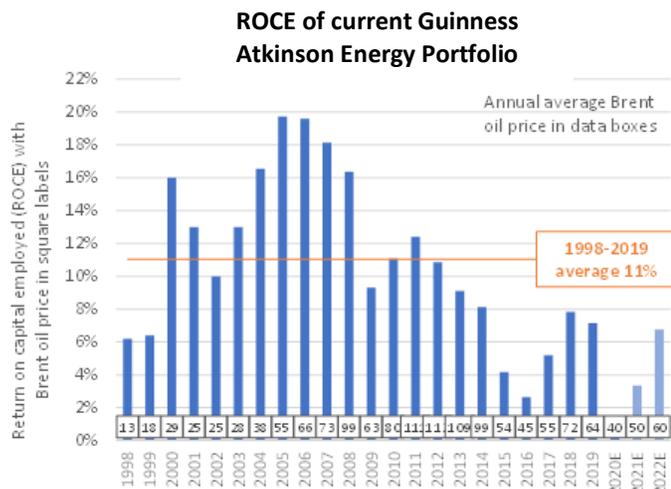
We see the low P/B ratio for the energy sector as driven by poor levels of return on capital employed ROCE. Historically the two measures are closely correlated.

Having recovered to around 7% in 2019, the collapse in oil prices in 2020 likely brings ROCE for the Guinness Atkinson Global Energy portfolio down to around 1%, just below the level seen in 2016 when the Brent oil price

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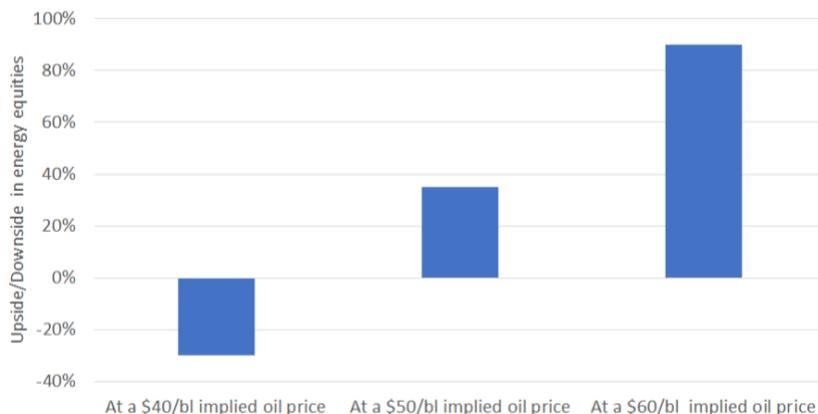
averaged \$45/bl. Our case base assumption sees the Brent oil price recover to average \$50/bl in 2021 and \$60/bl in 2022. In these circumstances, ROCE would rise to around 4% in 2021 and 7% in 2022, implying strong upside on a P/B basis:



Sources: Bernstein; Bloomberg; Guinness Atkinson Asset Management

Our valuation sensitivity work now shows upsides and downsides (Guinness Atkinson estimates) at the following oil prices:

Estimated upside/downside for Guinness Atkinson energy portfolio

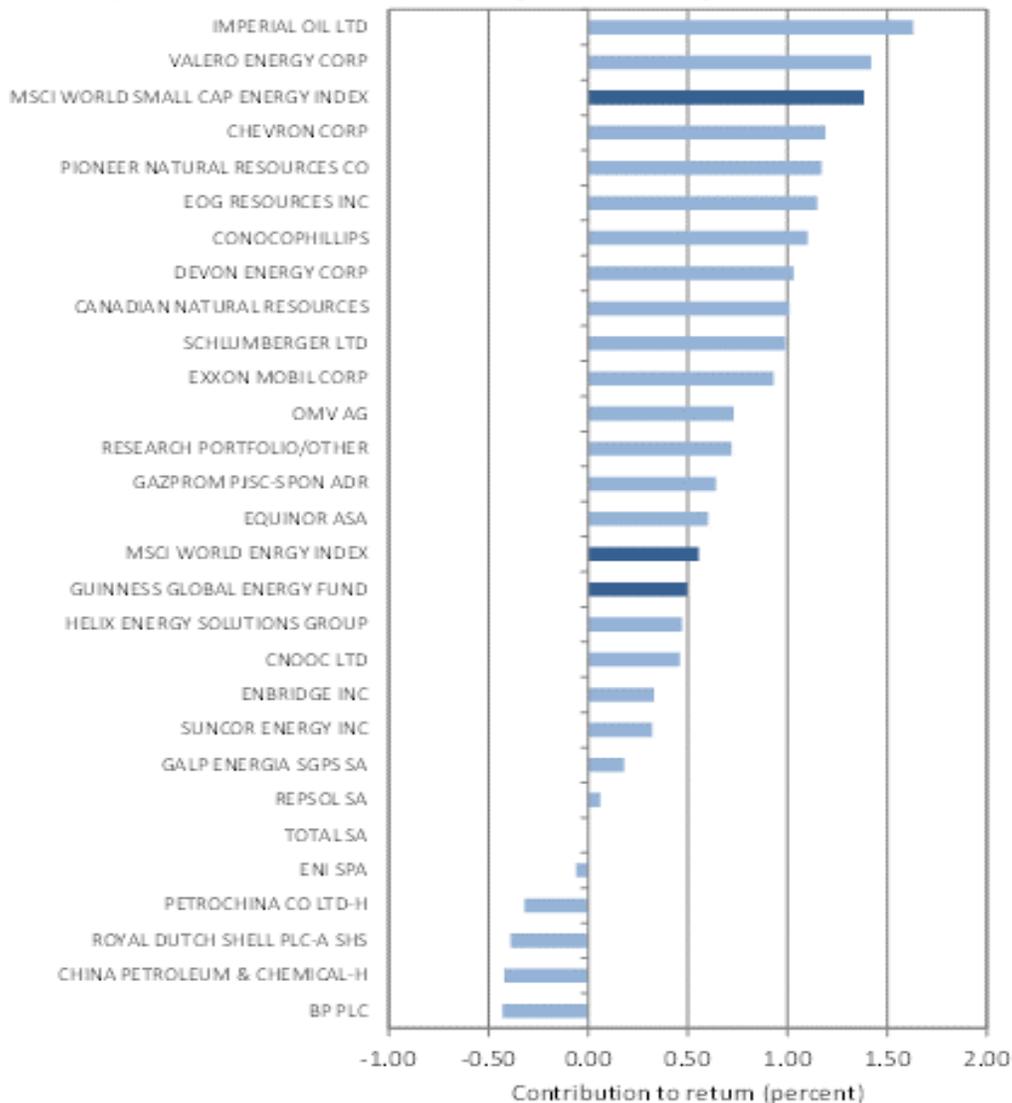


Source: Guinness Atkinson Asset Management

Our portfolio is currently tilted to large caps and majors, a mix of companies who we think are best placed in the energy sector to weather the downturn, while offering attractive upside in an oil price recovery. Our priority remains balance sheet work: ensuring that the oil producers we own have strong enough liquidity to come through a period of low prices in good shape.

3. Performance – Guinness Atkinson Global Energy Fund

The second quarter of 2020 was positive for global equities. The MSCI World Energy Index (net return) was up by 16.6%, underperforming the MSCI World Index which was up by 19.4%. Your fund was up by 15.6%, underperforming the energy index by 1.0%. The indicative contribution of each individual position held in the fund over the end of the quarter (total return in USD), excluding research holdings, can be seen in the chart below:



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/global-energy-fund/#fund_performance or call (800) 915-6566.

Guinness Atkinson
Global Energy Fund
 Managers Update – July 2020



Performance as of June 30, 2020 (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	Full year 2019	YTD 2020	1 year (annualized)	Last 3 years (annualized)	Since Inception (annualized)
Global Energy Fund	3.45%	24.58%	-19.62%	-26.99%	27.04%	-1.06%	-18.92%	10.40%	-41.03%	-42.09%	-14.91%	1.59%
MSCI World Energy NR Index	1.87%	18.12%	-11.60%	-22.80%	26.56%	4.97%	-15.84%	11.45%	-35.65%	-36.34%	-11.14%	1.80%
MSCI World Energy Small Cap Index (NR)	1.01%	16.06%	-33.33%	-37.58%	36.48%	-12.29%	-31.54%	-2.77%	-46.81%	-50.93%	-26.23%	6.76%
S&P 500 Index	15.99%	32.36%	13.66%	1.38%	11.76%	21.82%	-4.37%	31.48%	-5.77%	2.84%	6.69%	-3.38%

Source: Bloomberg

Expense ratio: 1.45% (gross) 1.91% (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/global-energy-fund/#fund_performance or call (800) 915-6566.

4. Portfolio – Guinness Atkinson Global Energy Fund

Sector Breakdown

The following table shows the asset allocation of the Fund at **June 30, 2020**.

Asset allocation as %NAV	Current	Change	Last year end			Previous year ends				
	Jun-20		Dec-19	Dec-18	Dec-17	Dec-16	Dec-15	Dec-14	Dec-13	Dec-12
Oil & Gas	95.9%	-2.8%	98.7%	96.7%	98.4%	96.7%	95.1%	93.7%	93.6%	98.6%
Integrated	56.8%	5.9%	50.8%	46.4%	42.9%	46.4%	41.5%	37.3%	38.4%	39.1%
Exploration & Production	23.4%	-6.9%	30.3%	35.8%	36.9%	35.8%	36.5%	36.2%	35.2%	41.6%
Drilling	0.0%	-0.1%	0.1%	2.2%	1.9%	2.2%	1.5%	3.3%	7.0%	7.4%
Equipment & Services	4.5%	-5.1%	9.6%	8.6%	9.5%	8.6%	11.4%	13.4%	9.8%	7.1%
Storage & Transportation	4.2%	0.2%	4.0%	0.0%	3.5%	0.0%	0.0%	0.0%	0.0%	0.0%
Refining & Marketing	7.1%	3.2%	3.9%	3.7%	3.7%	3.7%	4.2%	3.5%	3.1%	3.4%
Solar	1.3%	0.1%	1.2%	0.9%	1.4%	0.9%	4.7%	3.7%	2.6%	1.2%
Coal & Consumable Fuels	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Construction & Engineering	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	0.6%
Cash	2.8%	2.8%	0.1%	2.4%	0.2%	2.4%	0.2%	2.6%	2.6%	-0.4%

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

Portfolio Holdings

Our integrated and similar stock exposure (c.59%) is comprised of a mix of mid cap, mid/large cap and large cap stocks. Our five large caps are Chevron, BP, ExxonMobil, Royal Dutch Shell and Total. Mid/large and mid-caps are ENI, Equinor, GALP, Repsol and OMV. As of June 30, 2020, the median P/E ratio of this group was 9.0x 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.22%) 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 (EOG, Pioneer and Devon), with one other name (ConocoPhillips) having a mix of US and international production. One of the key metrics behind a number of the E&P stocks held is low enterprise value / proven reserves.

We have exposure to five (pure) emerging market stocks in the main portfolio, though one is a half-position, and in total represent 16% of the portfolio. Two are classified as integrations (Gazprom and PetroChina), one as refining (Sinopec) and two as E&P companies (CNOOC and Pharos Energy). Gazprom is the Russian national oil and gas company which produces approximately a quarter of the European Union gas demand and trades on 3.4x 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.

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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 modest exposure to oil service stocks, which comprise around 4% of the portfolio. The stocks we own are mainly diversified internationally (Helix 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.

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Portfolio as of June 30, 2020

Guinness Atkinson Global Energy Fund (30 June 2021)			Total return (USD)							P/E			EV/EBITDA		
Stock	% of NAV	3 months	6 months	1 year	YTD	3 years	5 years	10 years	Since fund launch	2019	2020E	2021E	2019	2020E	2021E
Integrated Oil & Gas															
Exxon Mobil Corp	4.6%	-9.9%	-31.0%	-31.9%	-32.6%	-35%	-34%	6%	-20%	19.1x	n/a	34.1x	6.5x	13.4x	8.8x
Chevron Corp	4.2%	-0.4%	-19.7%	-15.7%	-21.9%	0%	10%	81%	70%	14.2x	743.6x	41.1x	5.4x	10.3x	8.0x
Royal Dutch Shell PLC	4.0%	-25.5%	-43.5%	-46.2%	-44.9%	-31%	-27%	8%	-7%	7.6x	34.8x	12.9x	3.5x	6.3x	4.9x
Total SA	4.8%	-9.8%	-26.5%	-23.9%	-30.2%	-17%	-2%	39%	-1%	8.6x	33.0x	14.6x	4.3x	7.3x	5.6x
BP PLC	4.2%	-23.5%	-36.6%	-40.4%	-37.1%	-24%	-23%	-9%	-27%	8.0x	92.8x	11.9x	4.1x	6.8x	5.2x
Equinor ASA	4.4%	-1.0%	-18.4%	-19.3%	-24.7%	-4%	0%	18%	-10%	9.4x	64.4x	17.4x	2.7x	4.5x	3.3x
ENI SpA	4.0%	-22.9%	-37.4%	-35.7%	-39.0%	-31%	-32%	-10%	-42%	9.7x	n/a	22.5x	2.9x	5.2x	4.0x
Repsol SA	3.6%	-16.6%	-39.2%	-38.5%	-40.6%	-34%	-34%	-14%	-43%	5.8x	16.2x	7.3x	3.6x	5.8x	4.3x
Galp Energia SGPS SA	3.9%	-9.4%	-24.3%	-16.1%	-26.3%	-12%	26%	10%	-27%	14.7x	31.8x	14.8x	5.3x	7.1x	5.4x
OMV AG	4.2%	-20.8%	-42.1%	-29.8%	-41.3%	-32%	33%	45%	-23%	5.7x	16.8x	8.0x	3.4x	5.5x	3.9x
	41.9%														
Integrated / Oil & Gas E&P - Canada															
Suncor Energy Inc	3.6%	-36.9%	-43.9%	-41.8%	-47.0%	-39%	-30%	-28%	-53%	7.2x	n/a	115.0x	3.9x	12.3x	6.8x
Canadian Natural Resources Ltd	3.3%	-26.5%	-31.7%	-27.8%	-41.6%	-28%	-28%	-33%	-29%	7.1x	n/a	n/a	4.4x	12.5x	7.8x
Imperial Oil Ltd	4.2%	-28.3%	-36.9%	-40.5%	-40.7%	-42%	-56%	-54%	-65%	8.5x	n/a	n/a	5.2x	61.0x	10.2x
	11.1%														
Integrated Oil & Gas - Emerging market															
PetroChina Co Ltd	3.1%	-11.4%	-25.6%	-35.9%	-31.6%	-43%	-67%	-57%	-59%	9.0x	n/a	24.7x	4.6x	6.4x	5.3x
Gazprom PJSC	3.9%	-7.9%	-30.1%	-9.3%	-32.5%	61%	38%	-16%	-65%	3.4x	10.6x	5.5x	4.2x	5.9x	4.5x
	7.0%														
Oil & Gas E&P															
ConocoPhillips	3.6%	-12.0%	-28.4%	-26.3%	-34.0%	1%	-24%	49%	10%	11.5x	n/a	184.3x	3.4x	11.0x	7.1x
EOG Resources Inc	3.3%	-18.7%	-27.2%	-36.5%	-38.4%	-42%	-40%	5%	-6%	10.5x	272.4x	64.5x	4.0x	7.6x	6.8x
Pioneer Natural Resources Co	3.7%	-24.8%	-27.5%	-34.5%	-39.0%	-44%	-37%	47%	92%	12.4x	68.9x	42.7x	5.0x	8.2x	8.2x
Devon Energy Corp	2.4%	-32.6%	-49.8%	-56.0%	-57.9%	-67%	-82%	-81%	-88%	8.2x	n/a	n/a	2.8x	5.6x	5.8x
	12.9%														
International E&Ps															
CNOOC Ltd	3.4%	-18.8%	-23.3%	-27.5%	-33.1%	13%	-9%	4%	22%	6.0x	23.6x	11.3x	2.5x	4.2x	3.2x
Pharos Energy PLC	0.6%	-54.0%	-73.3%	-78.5%	-74.1%	-88%	-92%	-95%	-97%	13.7x	n/a	n/a	1.2x	2.3x	2.4x
	4.0%														
Midstream															
Enbridge Inc	4.2%	-11.7%	-11.7%	-6.1%	-15.7%	1%	-12%	118%	157%	15.5x	18.1x	15.1x	11.7x	12.0x	11.3x
	4.2%														
Equipment & Services															
Schlumberger Ltd	3.1%	-31.8%	-47.5%	-43.6%	-53.4%	-70%	-76%	-58%	-72%	12.6x	138.3x	437.9x	6.0x	10.8x	11.8x
Helix Energy Solutions Group Inc	1.2%	-49.9%	-59.5%	-50.3%	-65.1%	-33%	-79%	-69%	-89%	9.8x	n/a	n/a	4.2x	7.8x	9.3x
	4.3%														
Oil & Gas Refining & Marketing															
China Petroleum & Chemical Corp	2.8%	-10.2%	-17.4%	-28.5%	-23.1%	-29%	-29%	27%	24%	6.3x	32.4x	9.5x	4.5x	6.3x	4.9x
Valero Energy Corp	4.3%	2.3%	-28.2%	-0.6%	-26.8%	22%	37%	425%	110%	11.9x	n/a	14.6x	6.5x	18.0x	6.7x
	7.1%														
Research Portfolio															
Deltic Energy PLC	0.4%	-44.6%	-51.5%	-70.7%	-60.2%	-76%	-86%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
EnQuest PLC	0.6%	-43.0%	-38.7%	-42.2%	-49.0%	-63%	-77%	-87%	n/a	1.7x	n/a	29.6x	2.3x	4.5x	4.0x
JKX Oil & Gas PLC	0.5%	-16.0%	-29.1%	-64.1%	-33.7%	-21%	-54%	-94%	-97%	n/a	n/a	n/a	n/a	n/a	n/a
Reabold Resources PLC	0.8%	1.6%	-30.7%	-26.8%	-25.7%	-24%	-61%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Shandong Molong Petroleum Machinery Co Ltd	0.2%	-28.7%	-37.9%	-56.8%	-43.2%	-51%	-90%	-84%	-86%	n/a	n/a	n/a	n/a	n/a	n/a
Sunpower Corp	1.3%	-15.8%	-3.6%	-3.2%	-7.4%	-8%	-76%	-45%	-90%	n/a	n/a	104.9x	19.0x	48.1x	12.3x
Diversified Gas & Oil Company	0.7%	34.0%	4.2%	-12.7%	-3.7%	82%	n/a	n/a	n/a	7.0x	7.2x	9.7x	5.5x	4.8x	4.9x
	4.5%														
Cash															
	2.8%														
Portfolio															
	100.0%									8.7x	48.2x	18.8x	4.2x	7.7x	5.8x

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.

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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

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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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