

# THE GUINNESS GLOBAL ENERGY REPORT

Developments and trends for investors in the global energy sector

July 2021

## GUINNESS GLOBAL ENERGY FUND

The Guinness Global Energy Fund invests in listed equities of companies engaged in the exploration, production and distribution of oil, gas and other energy sources. We believe that over the next twenty years the combined effects of population growth, developing world industrialisation and diminishing fossil fuel supplies will force energy prices higher and generate growing profits for energy companies.

The Fund is run by co-managers Will Riley, Jonathan Waghorn and Tim Guinness, supported by Jamie Melrose (analyst). The investment philosophy, methodology and style which characterise the Guinness approach have been applied to the management of energy equity portfolios since 1998.

### Important information about this report

This report is primarily designed to inform you about recent developments in the energy markets invested in by the Guinness Global Energy Fund. It also provides information about the Fund's portfolio, including recent activity and performance. This document is provided for information only and all the information contained in it is believed to be reliable but may be inaccurate or incomplete; any opinions stated are honestly held at the time of writing, but are not guaranteed. The contents of the document should not therefore be relied upon. It is not an invitation to make an investment nor does it constitute an offer for sale.

## HIGHLIGHTS FOR JUNE

### OIL

#### WTI/Brent up strongly on tight market

Brent and WTI both up in June. WTI closed the month up \$8/bl at \$74/bl, whilst Brent also rose \$6/bl to \$75/bl. Global oil and refined product inventories continue to tighten, thanks to a demand recovery which is running ahead of the oil being fed back into the market by OPEC. OPEC+ met in early July but failed to reach agreement with UAE on extending quota terms from April 2022 to December 2022, adding short-term volatility.

### NATURAL GAS

#### US, European and Asian gas prices all strongly

Surging industrial activity as many economies recover from COVID, a cold start to the summer in Europe, drought in Brazil curbing hydro output, then extreme North American heat in June, have acted to create unusually tight gas markets. The European gas price (using UK NBP) rose to \$12.0/mcf; Japanese LNG prices to \$13.0/mcf; and the US spot price (Henry Hub) increased to \$3.6/mcf.

### EQUITIES

#### Energy outperforms the broad market in June

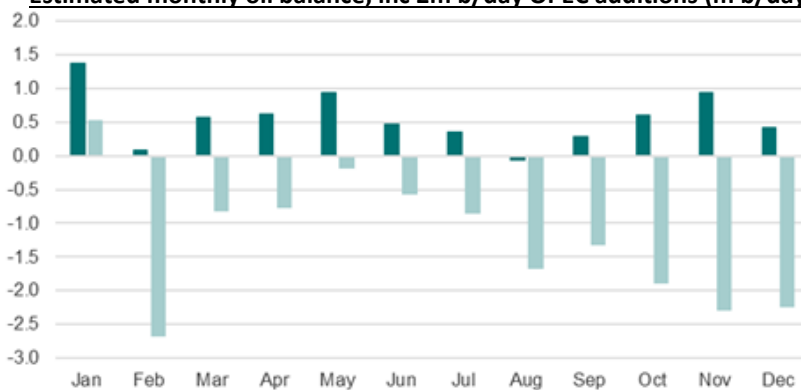
The MSCI World Energy Index (net return) rose by 2.9% in June, outperforming the MSCI World Index (net return) which rose by 1.4% over the month (all in US dollar terms).

## CHART OF THE MONTH

### Oil market looks undersupplied even with expected OPEC adds

The oil market has remained undersupplied since February 2021, causing global oil and refined product inventories to tighten. With the demand recovery expected over the rest of the year, even the additional barrels expected to be added by OPEC+ (2m b/day from July to Dec) are not sufficient to create balance. The focus therefore remains on OPEC to overcome the current impasse and add the barrels that are needed to avoid an overheated market.

Estimated monthly oil balance, inc 2m b/day OPEC additions (m b/day)



Source: IEA, DNB Markets

■ 10Y average (ex 2020) ■ 2021

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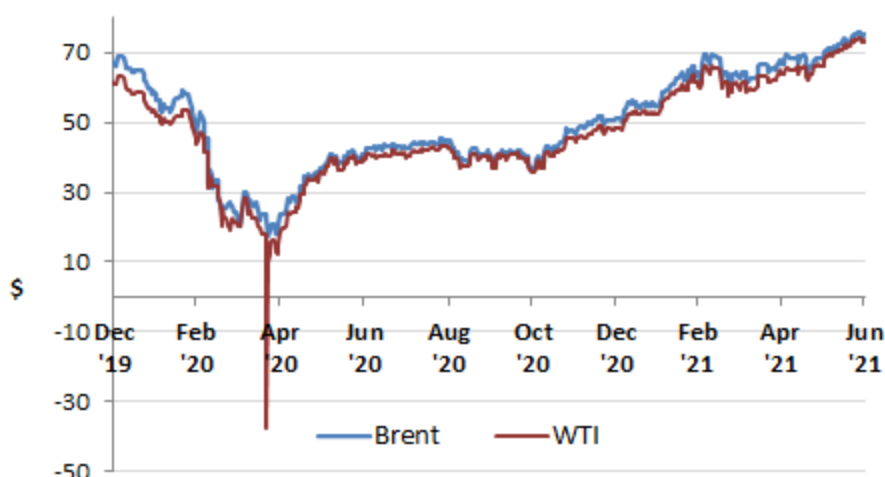
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**1. JUNE IN REVIEW**

**i) Oil market**

**Oil price (WTI and Brent \$/barrel): Dec 2019 to June 2021**



Source: Bloomberg LP

The West Texas Intermediate (WTI) oil price started June at \$66.6/bl and traded up gradually throughout the month, reaching a high of \$74.3/bl on June 26. The price then sipped slightly to close June at \$73.4/bl. WTI has averaged \$61.9/bl so far in 2021, having averaged \$40/bl in 2020, \$58/bl in 2019 and \$65/bl in 2018.

Brent oil traded in a similar shape, opening at \$68.7/bl and closing the month close to its highs at \$75.1/bl. Brent has averaged \$64.6/bl so far in 2021, having averaged \$42/bl in 2020, \$64/bl in 2019 and \$72/bl in 2018. The gap between the WTI and Brent benchmark oil prices closed slightly over the month, ending June at around \$2/bl, versus just below \$3/bl on average in 2020.

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

- Recovery in oil demand**

Global oil demand in the first half of 2021 is estimated to have risen by around 6m b/day (vs 1H 2020), as post-COVID recovery gained momentum. After expanded lockdowns in the first quarter, accelerated vaccination programmes contributed to mobility improving in US and Europe. Freight and industrial activity also surged. In June, the IEA published their first estimate for oil demand in 2022, with a 3m b/day rise expected. This would put global oil demand in 2022 on course for 99.5m b/day, around the same level as demand in 2019.

- **Capital discipline from non-OPEC oil producers**

In spite of the sharp rise in spot oil prices so far this year, the supply response from non-OPEC countries (outside the OPEC+ group) continues to be muted. This includes the US shale industry, where the rise in rigs actively drilling for oil has been far shallower than in the previous upcycle of 2016. In a recent interview, the CEO of Pioneer Natural Resources, one of the largest shale producers, said "I'm still confident the producers will not respond" to the run-up in prices. Consistent with the comments from Pioneer, we expect public sector shale oil companies to continue to prioritise free cashflow over growth, the former being rewarded by the stock market this year.

**Factors which weakened WTI and Brent oil prices in June:**

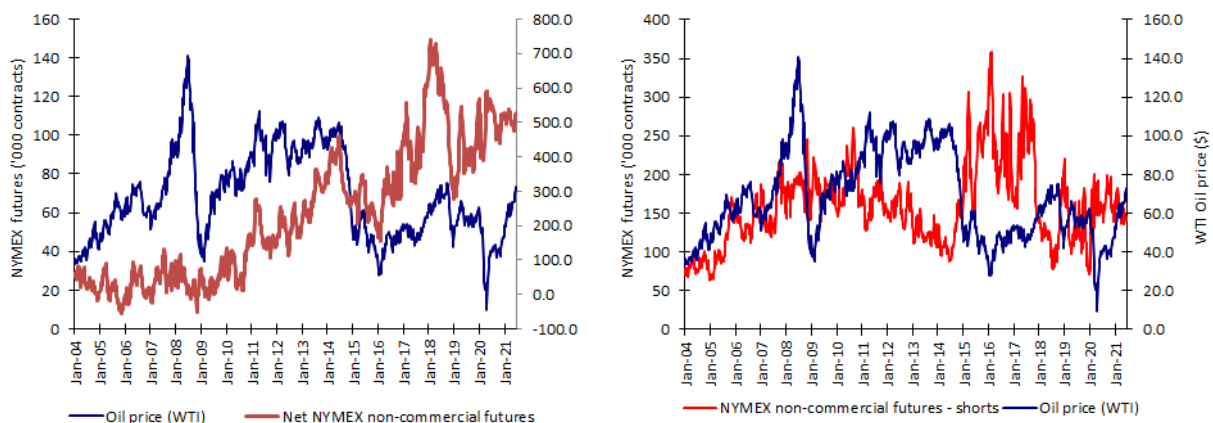
- **Rising expectations around the return of Iranian exports**

Negotiations between Iran and the West regarding the country's nuclear programme continued in June. Assuming the talks are successful, and using the previous ramp-up of Iranian production in 2016 as an analogy, we would expect to see Iranian supply rise to around 3.5m b/day (implying a 0.7m b/day increase) towards the end of 2021. If this occurs, we expect it to be absorbed reasonably easily into OPEC+'s plans.

**Speculative and investment flows**

The New York Mercantile Exchange (NYMEX) net non-commercial crude oil futures open position was 525,000 contracts long at the end of June versus 476,000 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 decreased to 144,000 contracts at the end of June versus 150,000 at the end of the previous month.

**NYMEX Non-commercial net and short futures contracts: WTI January 2004 – June 2021**

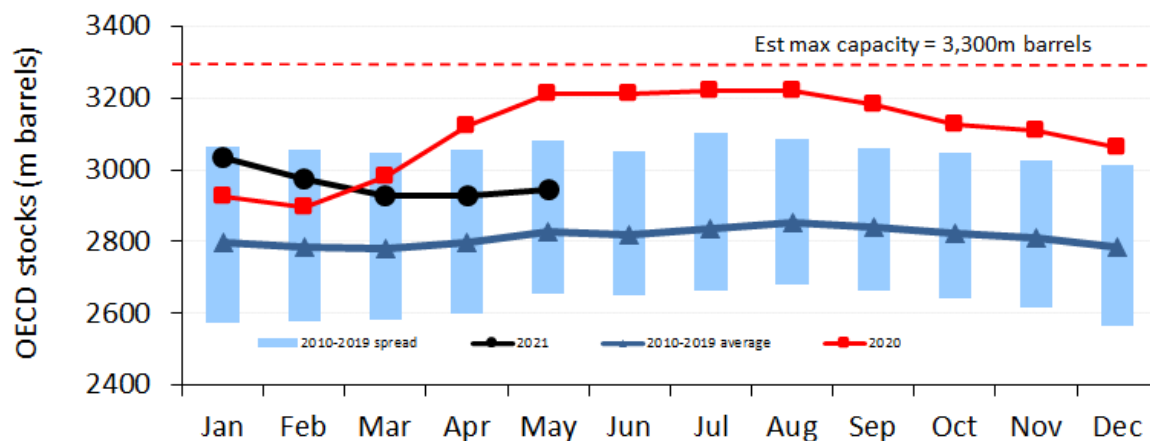


Source: Bloomberg LP/NYMEX/ICE (2021)

**OECD stocks**

OECD total product and crude inventories at the end of May (latest data point) were estimated by the IEA to be 2,944m barrels, up by 18 barrels versus the level reported for April. This compares to a 10-year average increase for May of 27m barrels, implying that the OECD market was undersupplied. The significant oversupply situation in 2020 pushed OECD inventory levels close to maximum capacity in August (c3.3bn barrels), with a tightening thereafter.

**OECD total product and crude inventories, monthly, 2004 to 2021**



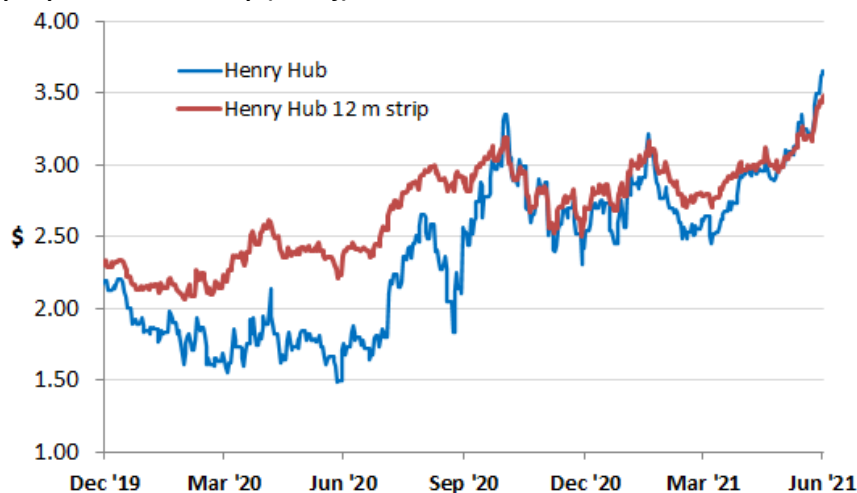
Source: IEA Oil Market Reports (June 2021 and older)

**ii) Natural gas market**

The US natural gas price (Henry Hub front month) opened June at \$2.99/mcf (1,000 cubic feet) and moved up strongly over the month, closing at \$3.65/mcf. The spot gas price has averaged \$2.84/mcf so far in 2021, having averaged \$2.13/mcf in 2020, \$2.53/mcf in 2019 and \$3.07 in 2018.

The 12-month gas strip price (a simple average of settlement prices for the next 12 months' futures prices) also rose over the month, opening at \$2.99/mcf and closing at \$3.48/mcf. The strip price averaged \$2.54 in 2020 having averaged \$2.60 in 2019, \$2.90 in 2018 and \$3.12 in 2017.

**Henry Hub gas spot price and 12m strip (\$/Mcf) 18 months Dec 2019 to June 2021**



Source: Bloomberg LP

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

- **Market undersupplied**

Injections into US natural gas inventories during June were lower than expected for the time of year. Adjusting for the impact of weather, the builds implied that the US gas market was, on average, around 3 Bcf/day undersupplied.

- **Lower than normal international gas inventories and stronger international demand**

The outlook for international natural gas markets (Asia and Europe) in the remainder of summer 2021 continues to strengthen as European natural gas inventories are currently running 25% below the 5yr

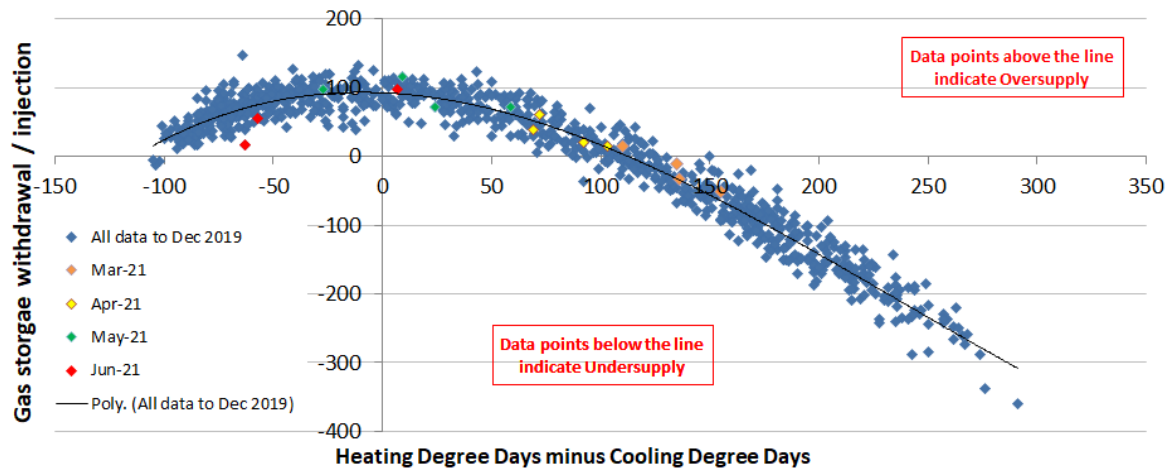
average (and around 50% below the 2020 levels), while Asian demand continues to rebound overall. In addition, exports of US natural gas to Mexico are surprisingly strong.

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

- **US onshore supply rising**

The latest US natural gas production data published by the EIA (for April) indicates that onshore supply of gas rose by 1.2 Bcf/day to 101.1 Bcf/day. This level of production is 0.6 Bcf/day higher than at the start of the year, but around 3 Bcf/day lower than peak production in Dec 2019. Despite the increase in supply so far in 2021, it has been more than outweighed by the rise in demand, coming from improving economic activity and rising LNG exports.

**Weather adjusted US natural gas inventory injections and withdrawals**

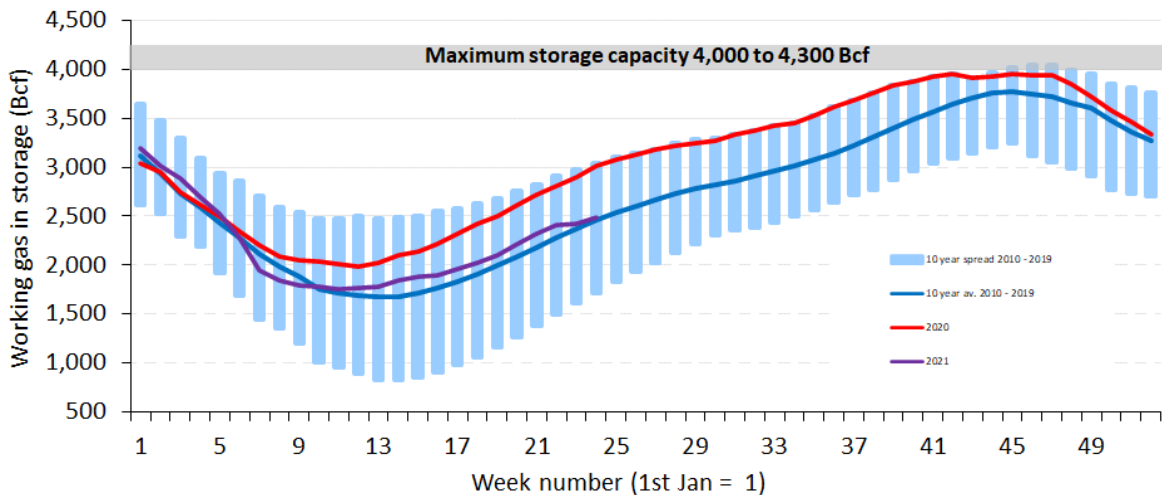


Source: Bloomberg LP; Guinness Asset Management

**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 2.5 Tcf. Current gas in storage is in line with the 10-year average.

**Deviation from 5yr gas storage norm**



Source: Bloomberg; EIA (June 2021)

## 2. MANAGER’S COMMENTS

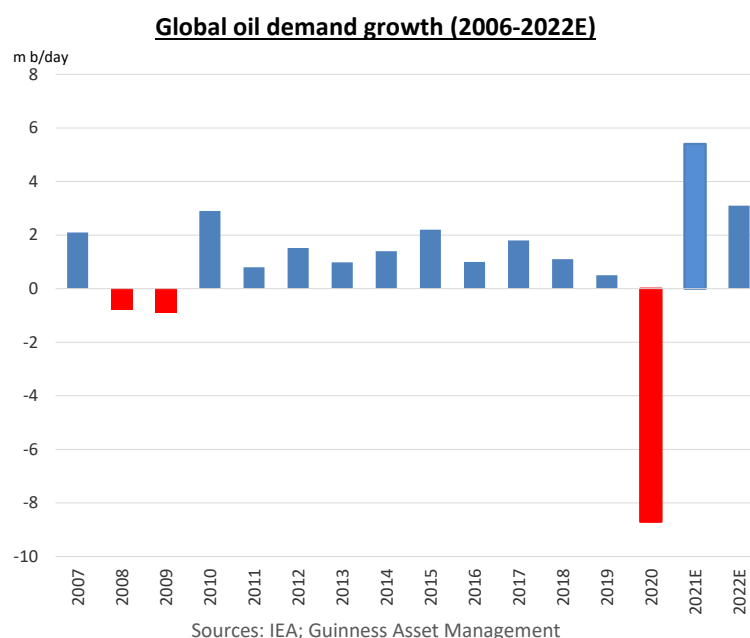
The first half of 2021 has seen a sustained improvement in the balance of the oil market. OPEC have kept their discipline, maintaining their production quotas at levels which have allowed global oil inventories to tighten. The recovery in global oil demand has been uneven, with new European lockdowns and rampant cases of COVID in India coming as setbacks. Overall, though, rising mobility and a surge in freight and industrial activity have helped to improve oil consumption significantly. Oil prices have responded positively, with the Brent spot price up by around 50% since the start of the year, creating a positive backdrop for oil & gas equities.

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

### Oil demand: bouncing back

Global oil demand in the first half of 2021 is estimated to have risen by around 6m b/day (vs 1H 2020), as post-COVID recovery gained momentum. After expanded lockdowns in the first quarter, accelerated vaccination programmes contributed to mobility improving in US and Europe. Freight and industrial activity surged. The recovery in activity in developed markets is faster than many were assuming earlier this year, helping offset a slower recovery in parts of South Asia and Latin America. The area of oil demand that continues to lag is aviation. Globally, commercial flights per day remained around 30% lower than in 2019. Even in this sector, however, there are signs of improvement. The recovery in US jet demand is accelerating, with jet fuel demand for domestic flights now around 15% below 2019 levels, having started the year 35% below.

Building an accurate view of annual global oil demand for 2021 depends on the path of the COVID recovery, and that remains uncertain. The IEA’s best estimate is for a recovery in demand in 2021 of around 5.5m b/day, followed by a 3m b/day rise in 2022. This would put global oil demand in 2022 on course for 99.5m b/day, around the same level as demand in 2019.

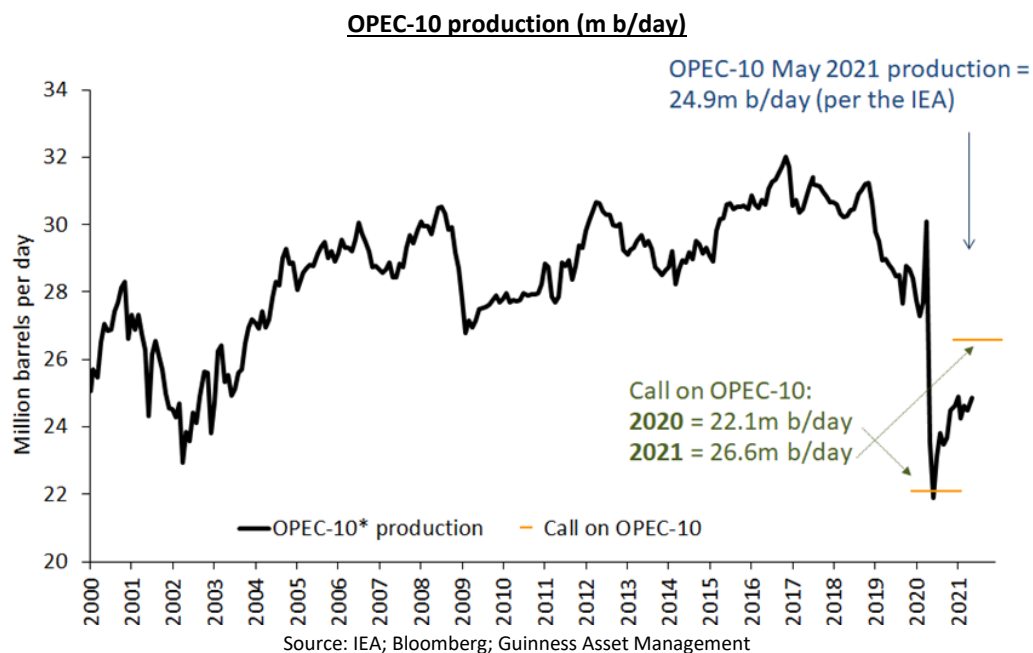


The underlying composition of the IEA's demand forecast for 2022 is interesting to note. Whilst total demand is essentially unchanged versus 2019, OECD demand is expected still to be around 1.6m b/day lower, whilst non-OECD demand is forecast to be 1.4m b/day higher than 2019. It is a reminder, then, of the unrelenting pressure on oil consumption coming from places like China, which has grown its demand as though COVID had never occurred.

### OPEC supply: in control of the oil market

OPEC, led by Saudi, have been focused this year on micromanaging the oil market as demand improves. Their approach has also been a cautious one, returning oil to the market but in volumes that have kept the overall balance tight. Outside OPEC+, there has been no significant supply response, leaving the direction of the oil price in OPEC's hands.

OPEC+ started the year with quotas 7.8m b/day below 'base line'. Saudi reacted to the softness in European demand in the first quarter with the unilateral decision to remove a further 1m b/day from the market. Since then, OPEC+ has been increasing its supply in accordance with the 2020 quota agreement, reducing the quota cut by June to 5.8m b/day. The group has been disciplined, maintaining at least 100% compliance with quotas every month so far in 2021.



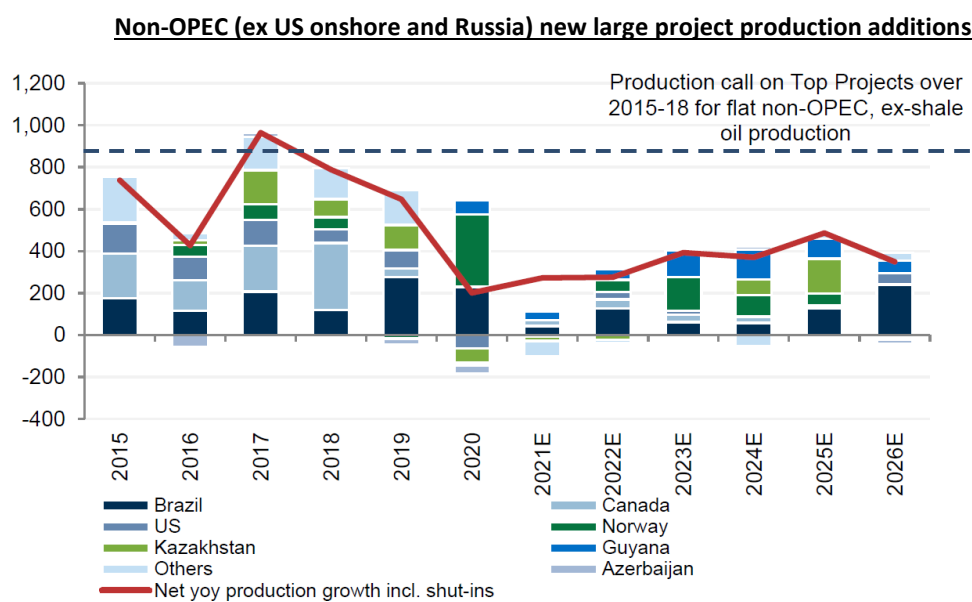
With the possibility of an overheating oil market, the Saudi energy minister responded in June by stating, "I'll believe it when I see it.", indicating Saudi's continued conservative output policy. However, with Brent oil prices over \$70/bl, tensions within the OPEC+ group have risen, with Russia content to see a lower price than Saudi and UAE scrapping for greater market share.

One other area that OPEC will be keeping a close eye on is Iran. A return to the JCPOA agreement remains a foreign policy priority for President Biden's administration, which would result in a lifting of sanctions on Iranian crude exports put in place by President Trump. Ultimately, if greater Iranian exports do return later in the year (base case is around 0.7m b/day), we expect OPEC+ to accommodate the ramp up, as it would be against the group's interest to do otherwise.

**Non-OPEC supply: anaemic spending; capital discipline being rewarded**

While oil prices have recovered post COVID, the effects of the pandemic will be felt in the industry for a number of years. Upstream oil and gas capital expenditure fell in 2020 by 28% to US\$225bn, the lowest level since 2005, as sharply lower oil prices reduced operating cash flow for oil and gas companies. This is the third reduction in excess of 25% that the industry has suffered in the last six years, bringing the 2020 spend to a level that is 60% lower than the 2014 peak of \$553bn. This year, upstream investment is expected to recover only marginally, rising by around 7% to \$240bn.

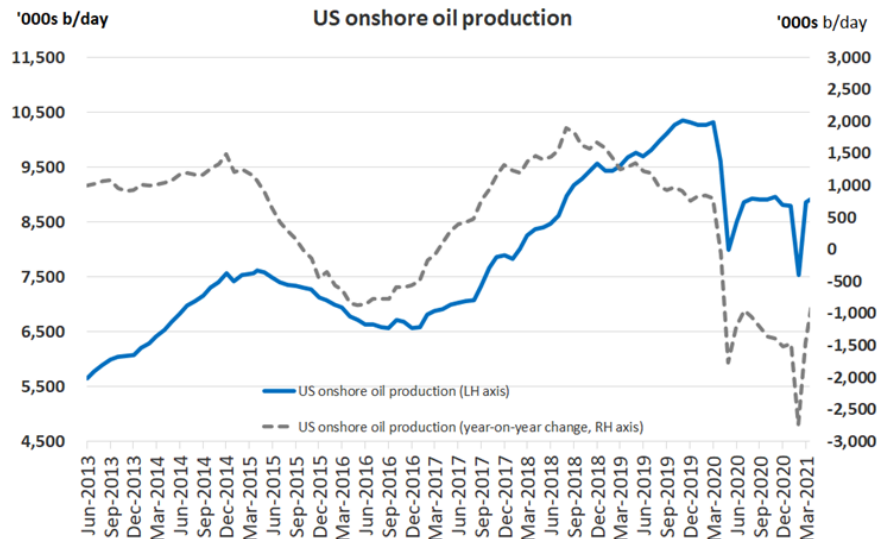
The reduced investment in 2020/2021 further compounds an already weakened outlook for oil project investment, increasing the risk that new large-scale oil projects will not be sufficient to satisfy demand. 2021 is shaping up to be the lowest year for large project additions since the early 2000s. And on average, the production outlook (ex US shale and Russia) in 2021-2026 is around 0.5m b/day lower per year than it was in 2017-2019. This anticipated slow down reflects the lower oil and gas investment seen between 2016 and 2021 and is unlikely to change even if oil prices recover from here.



For US shale oil, production has recovered from the lows of May/June 2020, but still sits around 1.4m b/day below the November 2019 peak of 10.4m b/day.

The last rebound in production, post the 2016 trough, was achieved thanks to equity and debt markets that kept on giving, combined with a producer mentality that favoured growth over returns. Even before the collapse in oil prices last March, producers had started to show better capital discipline that was slowing supply growth. And so far this year, shale oil producers have been adding back drilling rigs at a lower pace than in the 2016 cycle, with equity markets rewarding companies that are prioritising free cashflow and dividends over the recycling of cashflow into additional drilling.





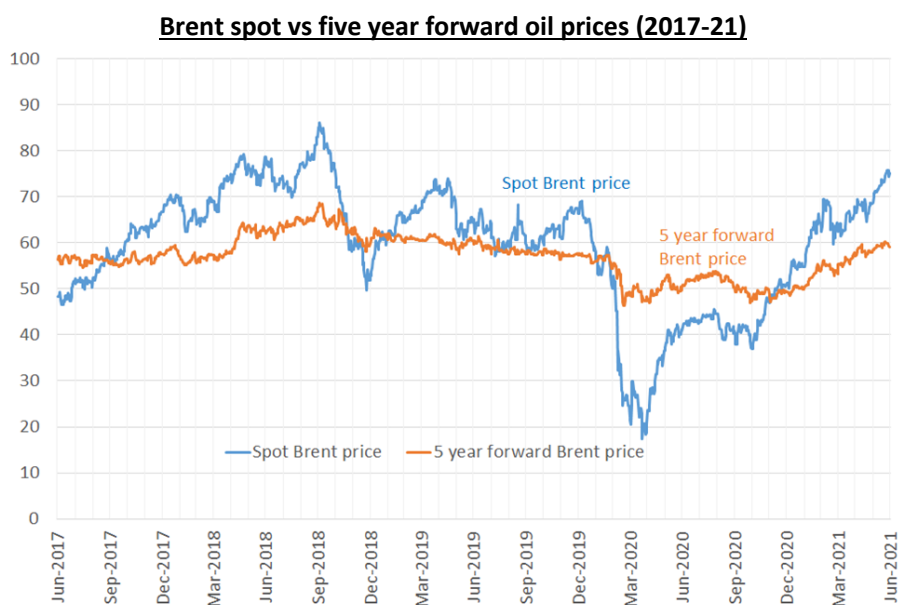
Source: EIA; Guinness Asset Management

Overall, non-OPEC supply is expected to recover by 0.8m b/day in 2021, having fallen by 2.5m b/day in 2020. By comparison, given that demand will rebound by over 5m b/day this year, it has fallen to OPEC to control market balance.

### Oil prices

Thanks to the events described above, spot oil prices rose strongly during the first half of 2021. Brent started the year at \$51/bl, moved up to nearly \$70/bl in early March, before falling to the low \$60s/bl. The price then resumed its upwards trajectory, reaching \$75/bl by the end of June. Brent spot has averaged \$65/bl so far this year, versus \$42/bl last year. The five-year forward Brent price opened the year at \$49/bl and rose steadily by the end of June to \$59/bl.

WTI oil prices in the US followed a similar path, with WTI reaching \$73/bl by the end of June. Five-year forward WTI was up from \$45/bl to \$54/bl.

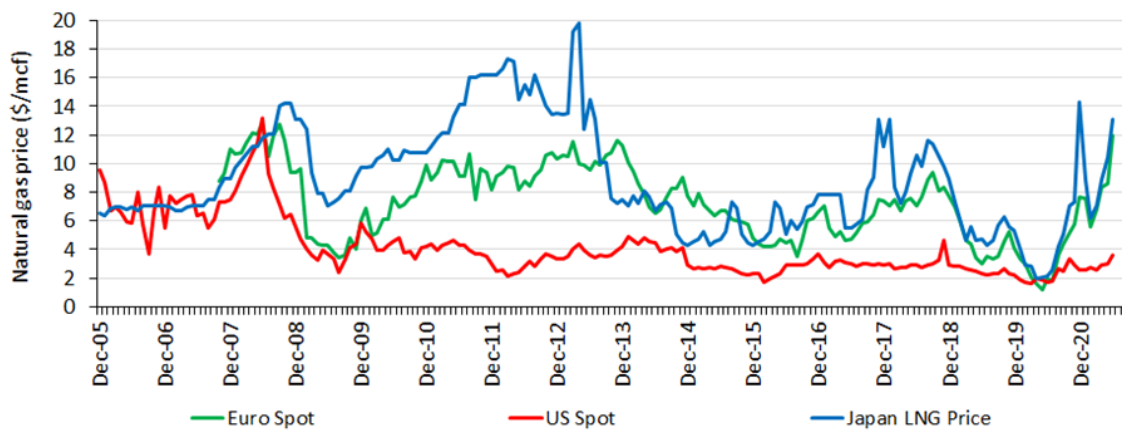


Source: Bloomberg

## Natural gas

For natural gas, a number of factors have come together across to globe to drive prices materially higher. Surging industrial activity as many economies recover from COVID, a cold start to the summer in Europe, drought in Brazil curbing hydro output, then extreme North American heat in June, have acted to create unusually tight markets. The European gas price (using UK NBP) rose from \$7.7/mcf to \$12.0/mcf; Japanese LNG prices rose from \$7.3/mcf to \$13.0/mcf; and the US spot price (Henry Hub) rose from \$2.5/mcf to \$3.6/mcf. In the US, exports of LNG have reached new highs of around 11Bcf/day, as the arbitrage between US and European/Asian prices has been wide enough to incentivise export operations running at full capacity.

### Global natural gas prices (US\$/mcf)



Source: Bloomberg; Guinness Asset Management

## Energy equities

Given the strength in oil and gas prices, the first half of 2021 has been positive period for energy equities. The sector (MSCI World Energy Index net return in USD) finished +32.4%, well ahead of the broad market (MSCI World +13.1%). The Guinness Global Energy Fund produced a total return of +34.5% (in USD), outperforming its index by 2.1%. See section 3 of this report for detailed performance data on the Guinness Global Energy Fund.

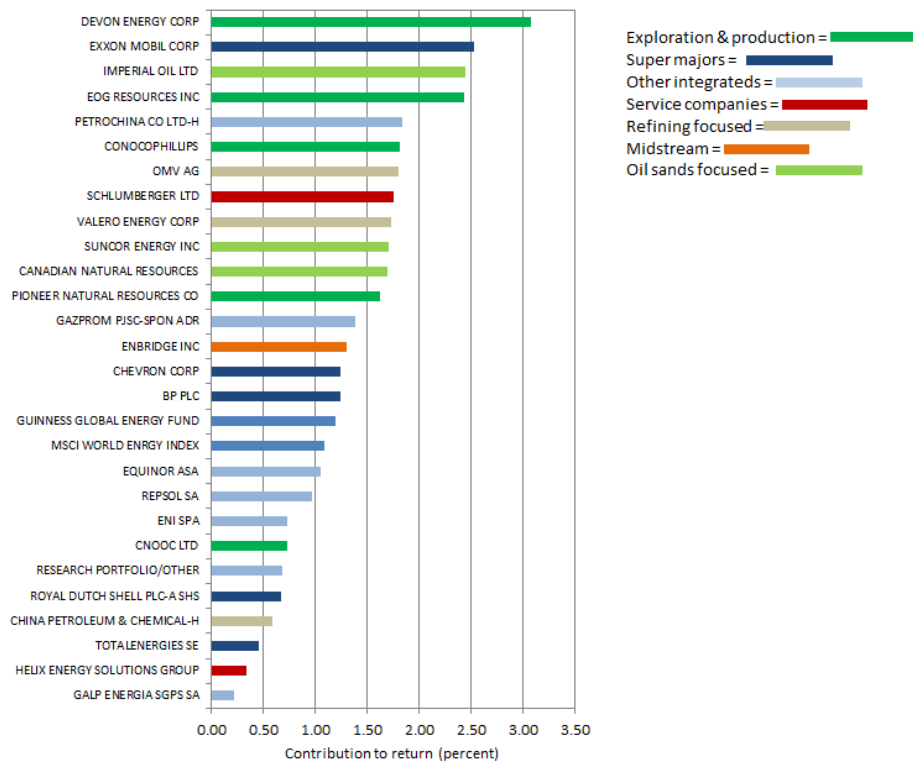
On a stock-by stock-basis in the fund, our three US shale oil biased E&P companies (Devon Energy Corp +89%; EOG Resources +69%; Pioneer Natural Resources +44%) were strong performers, enjoying a high degree of operational leverage to rising oil prices. US integrations (Exxon +57%; Chevron +27%) and our US refining holding (Valero +42%), also outperformed, benefitting from growing optimism around the US refining environment. Another subsector within the fund that outperformed over the first half of 2021 was Canadian integrations (Imperial Oil +63%; Canadian Natural Resources +55%; Suncor +45%), with high cost oil sands operations enjoying oil price leverage and growing free cashflow profiles.

Natural gas producers also did well, thanks to strength in the underlying commodity. Petrochina, which controls the majority of China's domestic natural gas reserves, was the stand-out larger cap gas name in the fund, up 62% since the start of the year.

Weaker subsectors in the fund included European majors (Galp +5%; Total +9%; Royal Dutch Shell +15%; all in USD), the common theme here being weaker prospects for downstream earnings as COVID-related lockdowns stepped up again across the continent, dampening product demand. We were reasonably pleased with the oil service exposure in the fund (Schlumberger +48%; Helix +36%), though much of the wider energy services sector remained weighed down by excess capacity concerns.

The contribution to performance of each position in the fund is summarised in the following chart:

**Estimated contribution by position for Global Energy Fund, in USD**



Source: Bloomberg; Guinness Asset Management

**Outlook**

Following the extraordinarily challenging events of the past eighteen months, market conditions for oil have swung firmly in OPEC’s favour. Owing to significant quota cuts since May 2020, the group still has a high level of spare production capacity, which tends to be bearish for prices. However, the anaemic supply response from non-OPEC countries in the COVID recovery has opened the door for OPEC to take control of the market again, as they did for much of the 1998-2008 period.

After a record surplus of oil in inventories in the middle of 2020, which pushed oil prices below \$20/bl, OPEC’s management of the global oil balance has resulted in much of the excess being worked off. Indeed, the pendulum has swung to a tight market, with the production increases agreed by OPEC at the start of July potentially not sufficient to prevent further tightness over the coming months. Hence, talk in the oil market has moved quickly to issues of inflation and demand destruction, should prices rise further from here. In some areas of the non-OECD, oil prices in local currency terms are already within touching distance of all-time highs. No surprise then that the Indian government, for example, has been vocal in its demands for OPEC to manage the oil price lower from here.

The path for oil demand will vary region by region, affected by price and how rapidly economies open up after COVID. The inflection in gasoline and distillate consumption, plus strength in petrochemical feedstock demand, likely continues for the remainder of the year, whilst the ongoing weakness in jet fuel recovery implies a longer period before jet demand reaches its previous peak. Overall, the IEA forecast demand in 2021 is 96.4m b/day, up by 5.4m b/day versus 2020. Demand is expected to rise in 2022 to 99.5m b/day, back essentially to the 2019 peak.

OPEC+ will be looking for the rest of this year to manage supply back into the market as the oil demand recovery allows. Tensions emerged at the July OPEC meeting, with a failure to agree on the UAE's demands for greater market share within the group resulting in no agreement around further supply increases in 2021. The likelihood is that OPEC agree on a further 2-2.5m b/day of supply increase for the remainder of the year, which looks needed to offset the recovery in demand, but until agreement is reached, the risk of a short-term 'blow up' is there.

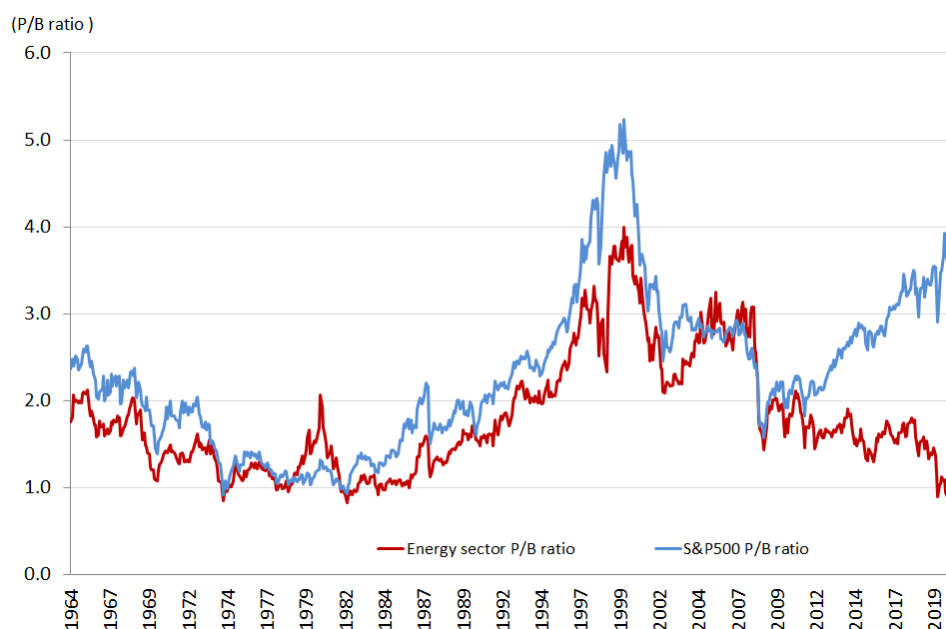
Iran remains another main wildcard within OPEC, with a return of Iranian exports likely at the latter part of 2021 if negotiations around their nuclear programme progress as expected. We expect this to be absorbed in OPEC's plans.

We see little threat to OPEC from US shale production for the rest of the year, though 2022 will see some pick up. Average US shale oil production in 2021 will be lower than in 2020. Non-OPEC (ex US shale) will take its share of the OPEC+ quota increases, but beyond that, there will be no major roll-out of large new projects, the cycle having peaked in 2020.

Ultimately, Saudi as OPEC 'kingpin' requires over \$70/bl to create fiscal breakeven for themselves. We believe that they continue to work to achieve an average price as close to this level as is sustainable, but mindful that too high a price is not in their interests as it will stimulate non-OPEC supply once again.

The recovery in crude prices so far this year has been accompanied by a strong rally in oil & gas equities, as the market adjusts to the tighter oil balance. The rise in energy equities has lifted the price-to-book ratio for the energy sector at the end of June to around 1.5x, having fallen as low as 0.7x in March 2020. This compares to the S&P 500 trading at over 4.5x. On a relative price-to-book (P/B) basis (versus the S&P500), therefore, the valuation of energy equities still sits close to a 55-year low, at 0.33x.

**Price to book ratio of S&P 500 vs energy sector (1965-2021)**

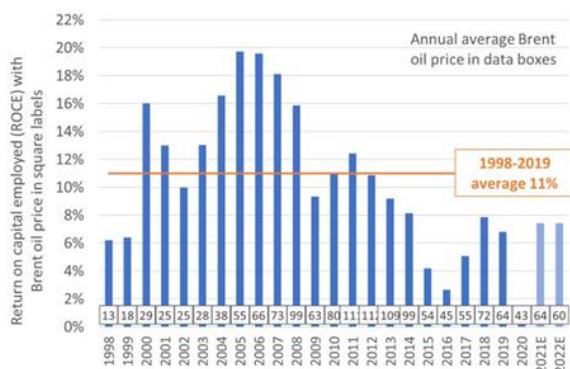


Sources: Bernstein; Bloomberg; Guinness Asset Management

We see the P/B ratio for the energy sector as driven by levels of return on capital employed ROCE, which remain depressed compared to history.

Having recovered to around 7% in 2019, the collapse in oil prices in 2020 brought ROCE for the Guinness Global Energy portfolio down to around 1%, just below the level seen in 2016 when the Brent oil price averaged \$45/bl. Our case base assumption sees the Brent oil price recover to average \$64/bl/\$60/bl in 2021 and 2022. In these circumstances, ROCE would rise to around 8% in both years, implying strong upside on a P/B basis:

**ROCE of current Guinness Energy portfolio**



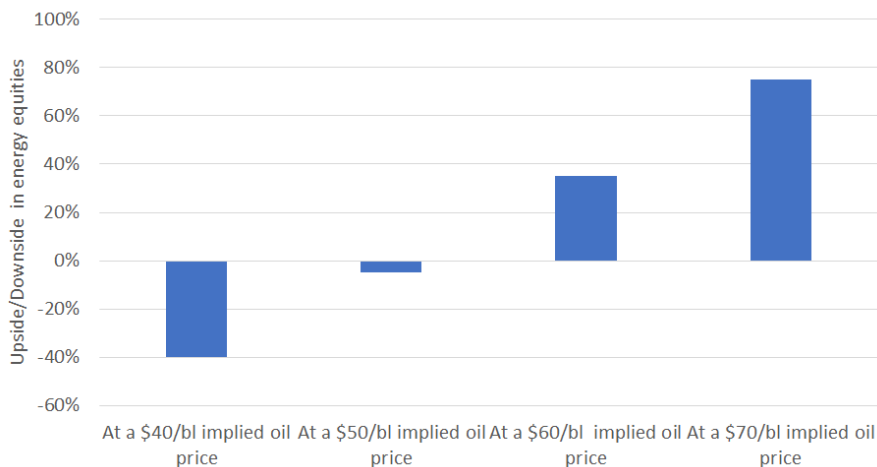
**ROCE vs P/B multiple for Guinness Energy portfolio**



Sources: Bernstein; Bloomberg; Guinness Asset Management

Our valuation sensitivity work now shows upsides and downsides at the following oil prices:

**Upside/downside for Guinness energy portfolio (1 year view)**



Source: Guinness Asset Management

Our portfolio is currently tilted to oil over gas. The predominant theme being companies that are well placed to weather volatility in oil markets, but that offer good upside in the oil price environment we describe above. Assuming an average Brent oil price of \$60/bl, we estimate the free cashflow yield of our portfolio, after capital expenditure, to be around 11%. The 2021E dividend yield of the portfolio currently sits at around 5%.

### 3. PERFORMANCE Guinness Global Energy Fund

The main index of oil and gas equities, the MSCI World Energy Index (net return), rose by 3.0% in June, while the MSCI World Index (net return) rose by 1.4%. The Fund was up by 2.6% (class Y\*) in the month, underperforming the MSCI World Energy index by 0.4% (all in US dollar terms).

Within the Fund, June's strongest performers were Petrochina, Devon, Conocophillips, Exxon and Gazprom while the weakest performers were Galp, Repsol, Imperial Oil, Valero and Sinopec.

\*Class Y formerly named the E class. OCF remains at 0.99%.

Cumulative % returns	YTD	1 month		3 months		6 months		1 year		3 years		5 years		From Launch (31/03/08)
Guinness Global Energy Fund (Class Y, 0.99% OCF)	34.5%	2.6%	10.6%	34.5%	49.0%	-29.9%	-15.7%	-35.0%						
MSCI World Energy NR Index	32.4%	3.0%	8.7%	32.4%	41.0%	-20.2%	-2.7%	-11.8%						
MSCI World Small Cap Energy Index	50.5%	7.1%	16.9%	50.5%	95.7%	-34.7%	-25.9%	-58.8%						
50/50 Mix of World Energy and Small Cap Index	41.4%	5.0%	12.8%	41.4%	68.3%	-27.5%	-14.3%	-35.3%						
<b>Calendar year</b>														
% returns	YTD	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008**
Guinness Global Energy Fund (Class Y, 0.99% OCF)	34.5%	-34.7%	9.8%	-19.7%	-1.3%	27.9%	-27.6%	-19.1%	24.4%	3.0%	-13.7%	15.3%	61.8%	-44.8%
MSCI World Energy NR Index	32.4%	-31.5%	11.4%	-15.8%	5.0%	26.6%	-22.8%	-11.6%	18.1%	1.9%	0.2%	11.9%	26.2%	-32.8%
MSCI World Small Cap Energy Index	50.5%	-30.5%	-2.3%	-31.3%	-12.0%	37.0%	-37.3%	-33.1%	16.4%	1.4%	-9.2%	34.8%	77.5%	-54.7%
50/50 Mix of World Energy and Small Cap Index	41.4%	-31.0%	4.6%	-23.6%	-3.5%	31.8%	-30.1%	-22.3%	17.3%	1.6%	-4.5%	23.3%	51.9%	-43.8%

Source: Guinness Asset Management and Bloomberg, bid to bid, gross income reinvested, in US dollars

Calculation by Guinness Asset Management Limited, \*\*Simulated past performance prior to 31.3.08, launch date of Guinness Global Energy Fund. The Guinness Global Energy investment team has been running global energy funds in accordance with the same methodology continuously since November 1998. These returns are calculated using a composite of the Investec GSF Global Energy Fund class A to 29.2.08 (managed by the Guinness team until this date); the Guinness Atkinson Global Energy Fund (sister US mutual fund) from 1.3.08 to 31.3.08 (launch date of this Fund), the Guinness Global Energy Fund class A (1.49% OCF) from launch to 02.09.08, and class Y (0.99% OCF) thereafter. Performance would be lower if an initial charge and/or redemption fee were included. Returns for share classes with a different OCF will vary accordingly

#### TB Guinness Global Energy Fund

UK investors should be aware that the Guinness Global Energy Fund is now available as a UK domiciled fund denominated in GBP. The TB Guinness Global Energy Fund is available from 0.95% OCF. The historical performance of this fund will differ from the Guinness Global Energy Fund as the TB Guinness Global Energy fund has only been recently brought into line with the Guinness Global Energy Fund. The documentation needed to make an investment, including the Prospectus, the Key Investor Information Document (KIID) and the Application Form, is available from the website [www.guinnessfunds.com](http://www.guinnessfunds.com)

Please contact [info@guinnessfunds.com](mailto:info@guinnessfunds.com) or +44 (0) 20 7222 5703 for more details

**Past performance should not be taken as an indicator of future performance. The value of this investment and any income arising from it can fall as well as rise as a result of market and currency fluctuations as well as other factors. You may lose money in this investment.**

**Returns stated above are in US dollars; returns in other currencies may be higher or lower as a result of currency fluctuations. Investors may be subject to tax on distributions.**

**The Fund's Prospectus gives a full explanation of the characteristics of the Fund and is available at [www.guinnessfunds.com](http://www.guinnessfunds.com).**

## 4. PORTFOLIO Guinness Global Energy Fund

### Buys/Sells

There were no buys and sells during the month, but the portfolio was actively rebalanced.

### Sector Breakdown

The following table shows the asset allocation of the Fund at **June 30 2021**.

Asset allocation as %NAV	Current	Change	Last year end		Previous year ends					
	Jun-21		Dec-20	Dec-19	Dec-18	Dec-17	Dec-16	Dec-15	Dec-14	Dec-13
<b>Oil &amp; Gas</b>	<b>95.7%</b>	<b>0.9%</b>	<b>94.8%</b>	<b>98.3%</b>	<b>96.7%</b>	<b>98.4%</b>	<b>96.7%</b>	<b>95.1%</b>	<b>93.7%</b>	<b>93.6%</b>
Integrated	54.8%	-1.5%	56.3%	51.1%	46.4%	42.9%	46.4%	41.5%	37.3%	38.4%
Exploration & Production	24.7%	2.4%	22.2%	29.6%	35.8%	36.9%	35.8%	36.5%	36.2%	35.2%
Drilling	0.0%	0.0%	0.0%	0.1%	2.2%	1.9%	2.2%	1.5%	3.3%	7.0%
Equipment & Services	4.9%	0.3%	4.6%	9.6%	8.6%	9.5%	8.6%	11.4%	13.4%	9.8%
Storage & Transportation	4.3%	-0.2%	4.4%	4.0%	0.0%	3.5%	0.0%	0.0%	0.0%	0.0%
Refining & Marketing	7.0%	-0.3%	7.3%	3.8%	3.7%	3.7%	3.7%	4.2%	3.5%	3.1%
Solar	1.5%	-0.3%	1.8%	0.7%	0.9%	1.4%	0.9%	4.7%	3.7%	2.6%
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%	0.0%	1.2%
Cash	2.8%	-0.5%	3.3%	1.1%	2.4%	0.2%	2.4%	0.2%	2.6%	2.6%

Source: Guinness Asset Management  
Basis: Global Industry Classification Standard (GICS)

The Fund at end of June 2021 was on a price to earnings ratio (P/E) for 2021/2022 of 11.0x/9.7x versus the MSCI World Index at 20.6x/18.8x as set out in the following table:

As at 30 June 2021	P/E		
	2020	2021E	2022E
Guinness Global Energy Fund	61.0x	11.0x	9.7x
MSCI World Index	37.0x	20.6x	18.8x
<i>Fund Premium/(Discount)</i>	<i>65%</i>	<i>-47%</i>	<i>-48%</i>

Source: Bloomberg; Guinness Asset Management Ltd

### Portfolio holdings

Our integrated and similar stock exposure (c.55%) 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. At May 31 2021 the median P/E ratio of this group was 10.0x 2021 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.25%) 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 3.5x 2021 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.

The portfolio contains one midstream holding, Enbridge, North America's largest pipeline company. With the growth of hydrocarbon demand 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 5% 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.



## Portfolio at May 31 2021 (for compliance reasons disclosed one month in arrears)

Guinness Global Energy Fund (28 May 2021)			P/E			EV/EBITDA			Price/Book		
Stock	ISIN	% of NAV	2020	2021E	2022E	2020	2021E	2022E	2020	2021E	2022E
<b>Integrated Oil &amp; Gas</b>											
Exxon Mobil Corp	US30231G1022	4.6%	n/a	16.5x	13.5x	15.8x	7.2x	6.5x	1.5x	1.5x	1.5x
Chevron Corp	US1667641005	4.3%	n/a	18.2x	15.9x	13.7x	6.8x	6.4x	1.5x	1.5x	1.5x
Royal Dutch Shell PLC	GB00B03MLX29	3.8%	30.8x	8.7x	7.6x	6.5x	4.2x	3.9x	1.0x	0.9x	0.8x
Total SA	FR0000120271	3.8%	32.3x	10.6x	9.4x	8.8x	5.2x	4.8x	1.1x	1.1x	1.1x
BP PLC	GB0007980591	4.3%	n/a	9.6x	8.5x	10.9x	4.5x	4.3x	1.2x	1.1x	1.1x
Equinor ASA	NO0010096985	4.0%	39.0x	10.7x	12.8x	4.7x	3.0x	3.2x	2.0x	1.8x	1.7x
ENI SpA	IT0003132476	3.6%	n/a	14.3x	10.8x	5.7x	3.7x	3.4x	0.9x	0.9x	0.9x
Repsol SA	ES0173516115	4.0%	52.9x	9.9x	8.4x	6.3x	4.2x	3.9x	0.7x	0.8x	0.8x
Galp Energia SGPS SA	PTGAL0AM0009	3.3%	n/a	19.0x	14.1x	7.2x	5.0x	4.5x	2.4x	2.5x	2.4x
OMV AG	AT0000743059	4.4%	23.0x	8.4x	8.0x	8.8x	5.0x	4.9x	1.2x	1.0x	0.9x
		<b>40.1%</b>									
<b>Integrated / Oil &amp; Gas E&amp;P - Canada</b>											
Suncor Energy Inc	CA8672241079	4.1%	n/a	10.7x	10.2x	13.6x	4.9x	4.6x	1.3x	1.1x	1.1x
Canadian Natural Resources Ltd	CA1363851017	3.5%	n/a	10.2x	10.7x	12.5x	5.2x	5.0x	1.6x	1.4x	1.3x
Imperial Oil Ltd	CA4530384086	4.5%	n/a	12.5x	12.0x	37.7x	6.4x	6.2x	1.4x	1.3x	1.2x
		<b>12.2%</b>									
<b>Integrated Oil &amp; Gas - Emerging market</b>											
PetroChina Co Ltd	CNE1000003W8	3.4%	25.5x	7.2x	7.7x	4.8x	3.7x	3.7x	0.4x	0.4x	0.4x
Gazprom PJSC	US3682872078	4.0%	165.2x	4.7x	4.7x	6.6x	3.8x	3.4x	0.4x	0.3x	0.3x
		<b>7.4%</b>									
<b>Oil &amp; Gas E&amp;P</b>											
ConocoPhillips	US20825C1045	3.6%	n/a	16.8x	15.6x	16.2x	5.8x	5.4x	2.0x	1.7x	1.6x
EOG Resources Inc	US26875P1012	4.2%	73.3x	13.2x	13.0x	10.0x	5.6x	5.4x	2.3x	2.0x	1.8x
Pioneer Natural Resources Co	US7237871071	3.8%	97.4x	13.8x	9.9x	19.3x	7.1x	5.5x	2.1x	1.7x	1.5x
Devon Energy Corp	US25179M1036	4.4%	n/a	12.6x	9.6x	15.0x	5.3x	4.6x	3.2x	2.2x	1.3x
		<b>16.0%</b>									
<b>International E&amp;Ps</b>											
CNOOC Ltd	HK0883013259	2.3%	12.9x	5.1x	4.8x	3.7x	2.3x	2.1x	0.7x	0.7x	0.6x
Pharos Energy PLC	GB00B572ZV91	0.3%	n/a	n/a	11.7x	2.3x	2.1x	1.4x	n/a	n/a	n/a
		<b>2.6%</b>									
<b>Midstream</b>											
Enbridge Inc	CA29250N1050	4.2%	19.9x	17.4x	15.3x	12.8x	11.7x	10.7x	1.7x	1.7x	1.7x
		<b>4.2%</b>									
<b>Equipment &amp; Services</b>											
Schlumberger Ltd	AN8068571086	4.0%	48.7x	28.8x	20.2x	13.7x	12.4x	10.4x	3.6x	3.3x	3.0x
Helix Energy Solutions Group Inc	US42330P1075	0.9%	n/a	n/a	n/a	6.1x	9.5x	8.0x	0.5x	0.5x	0.5x
		<b>4.9%</b>									
<b>Oil &amp; Gas Refining &amp; Marketing</b>											
China Petroleum & Chemical Corp	CNE1000002Q2	3.2%	12.1x	6.9x	6.8x	5.8x	4.0x	3.8x	0.6x	0.5x	0.5x
Valero Energy Corp	US91913Y1001	4.4%	n/a	70.7x	13.8x	42.3x	11.3x	6.6x	1.9x	1.8x	1.8x
		<b>7.6%</b>									
<b>Research Portfolio</b>											
Deltic Energy PLC	GB00B65YKF01	0.3%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
EnQuest PLC	GB00B635TG28	0.5%	n/a	1.9x	1.3x	4.6x	3.0x	2.7x	1.7x	n/a	n/a
JKX Oil & Gas PLC	GB0004697420	0.1%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Reabold Resources PLC	GB00B95L0551	0.4%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sunpower Corp	US8676524064	1.1%	n/a	83.2x	40.4x	139.9x	34.3x	24.8x	334.1x	8.3x	6.4x
Maxeon Solar Technologies Ltd	SGXZ25336314	0.1%	n/a	n/a	n/a	n/a	n/a	38.9x	n/a	n/a	n/a
Diversified Energy Company	GB00BYX7JT74	0.6%	6.5x	9.6x	12.0x	6.5x	6.3x	6.9x	1.1x	1.1x	1.1x
		<b>3.1%</b>									
<b>Cash</b>											
		<b>2.0%</b>									
<b>Portfolio</b>		<b>100.0%</b>	<b>59.3x</b>	<b>11.4x</b>	<b>10.1x</b>	<b>9.1x</b>	<b>5.2x</b>	<b>4.8x</b>	<b>1.2x</b>	<b>1.1x</b>	<b>1.0x</b>

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.

## 5. OUTLOOK

## i) Oil market

The table below illustrates the difference between the growth in world oil demand and non-OPEC supply since 2015:

	2015	2016	2017	2018	2019	2020	2021E	2022E
							<i>IEA</i>	<i>IEA</i>
<b>World Demand</b>	<b>95.3</b>	<b>96.4</b>	<b>98.2</b>	<b>99.2</b>	<b>99.7</b>	<b>91.0</b>	<b>96.4</b>	<b>99.5</b>
Non-OPEC supply (inc NGLs)	60.3	59.8	60.8	63.6	65.6	63.1	63.9	65.7
OPEC NGLs	5.2	5.3	5.4	5.5	5.4	5.2	5.3	5.5
<b>Non-OPEC supply plus OPEC NGLs</b>	<b>65.5</b>	<b>65.1</b>	<b>66.2</b>	<b>69.1</b>	<b>71.0</b>	<b>68.3</b>	<b>69.2</b>	<b>71.2</b>
<b>Call on OPEC (crude oil)</b>	<b>29.8</b>	<b>31.3</b>	<b>32.0</b>	<b>30.1</b>	<b>28.7</b>	<b>22.7</b>	<b>27.2</b>	<b>28.3</b>
Congo supply adjustment	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Gabon supply adjustment	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Eq Guinea supply adjustment	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
<b>Call on OPEC-10 (crude oil)</b>	<b>29.2</b>	<b>30.7</b>	<b>31.4</b>	<b>29.5</b>	<b>28.1</b>	<b>22.1</b>	<b>26.6</b>	<b>27.7</b>

Source: Bloomberg; IEA; Guinness Asset Management

Global oil demand in 2019 was 13m b/day higher than the pre-financial crisis (2007) peak. This means the combined effect of the 2007/08 oil price spike and the 2008/09 recession was shrugged off remarkably quickly, thanks to growth in demand from emerging markets. The demand picture for 2020, down by nearly 9m b/day, was heavily clouded by the impact of the COVID-19 virus and efforts to mitigate its spread. The IEA's best estimate is that demand will recover this year by around 5.4m b/day, leaving overall consumption on a par with 2016 but still around 3m b/day below the 2019 peak.

**OPEC**

The last five years have proved a testing time for OPEC. They have tried to keep prices strong enough that OPEC economies are not running excessive deficits, whilst not pushing the price too high and over-stimulating non-OPEC supply.

The effect of \$100+ bbl oil, enjoyed for most of the 2011-2014 period, emerged in 2014 in the form of an acceleration in US shale oil production and an acceleration in the number of large non-OPEC (ex US onshore) projects reaching production. OPEC met in late 2014 and responded to rising non-OPEC supply with a significant change in strategy to one that prioritised market share over price. Post the November 2014 meeting, OPEC not only maintained their quota but also raised production significantly, up over 18 months by 2.5m b/day. This contributed to an oversupplied market in 2015 and 2016.

In November 2016, faced with sharply lower oil prices, OPEC stepped back from their market share stance, announcing plans for the first production cut since 2008, opting for a new production limit of 32.5m b/day. The

announcement represented a cut of 1.2m b/day. There was also an understanding that non-OPEC, including Russia, would cut production by 0.6m b/day, taking the total reduction to 1.8m b/day.

**OPEC-10 oil production to 30 June 2021**

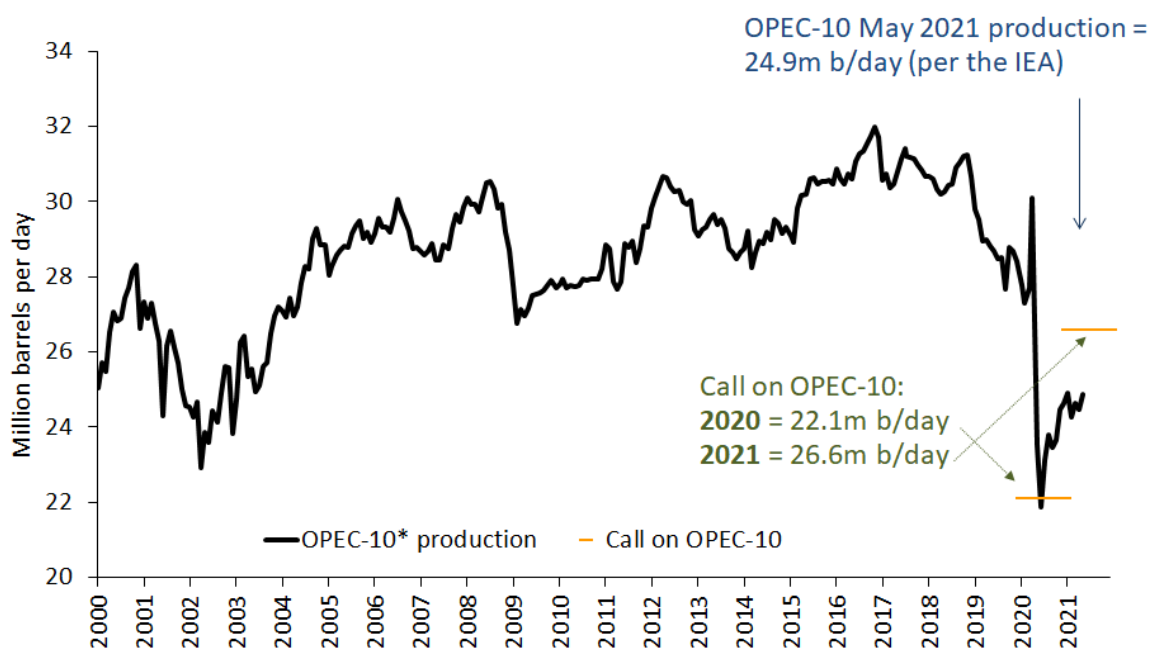
('000 b/day)	31-Dec-19	31-May-21	30-Jun-21	Current vs Dec 2019	Current vs last month
Saudi	9,730	8,460	8,950	-780	490
Iran	2,080	2,400	2,490	410	90
Iraq	4,610	3,960	4,000	-610	40
UAE	3,040	2,690	2,745	-295	55
Kuwait	2,710	2,350	2,380	-330	30
Nigeria	1,820	1,530	1,570	-250	40
Venezuela	730	470	540	-190	70
Angola	1,390	1,120	1,120	-270	0
Libya	1,110	1,140	1,170	60	30
Algeria	1,010	890	900	-110	10
<b>OPEC-10</b>	<b>28,230</b>	<b>25,010</b>	<b>25,865</b>	<b>-2,365</b>	<b>855</b>

Source: Bloomberg; Guinness Asset Management

The 2017-19 period continued to see a volatile time for OPEC with further production cuts necessary to balance ongoing non-OPEC supply growth.

The challenge for OPEC then ballooned in 2020 with the onset of COVID around the world. Initially, OPEC and their non-OPEC partners failed to reach agreement around their response to demand from the spread of the virus, precipitating a fall-out between participants and a short-lived price war. In light of extreme oil market oversupply, OPEC and non-OPEC partners reconvened in April 2020 and confirmed a deal to cut their production by 9.7m b/day, relative to their 'baseline' production level of October 2018. The cuts extend until April 2022, gradually stepping down in size over the period. The agreement gives us confidence that OPEC is looking to do 'what it takes' to bring the market back into balance, despite extreme challenges in the shorter term.

**OPEC-10 apparent production vs call on OPEC 2000 – 2021**



Source: IEA Oil Market Report (June 2021 and prior); Guinness estimates

OPEC’s actions in recent years have generally demonstrated a commitment to delivering a reasonable oil price to satisfy their own economies but also to incentivise investment in long term projects. Saudi’s actions at the head of OPEC have been designed to achieve an oil price that to some extent closes their fiscal deficit (c.\$70/bl is needed to close the gap fully), whilst not spiking the oil price too high and over-stimulating non-OPEC supply.

In the shorter term, the COVID-19 crisis has created particularly challenging conditions. Longer term, however, we believe that Saudi seek a ‘good’ oil price, well in excess of current levels to balance their fiscal needs, but they realise that patience is required to achieve that goal.

Overall, we reiterate two important criteria for Saudi:

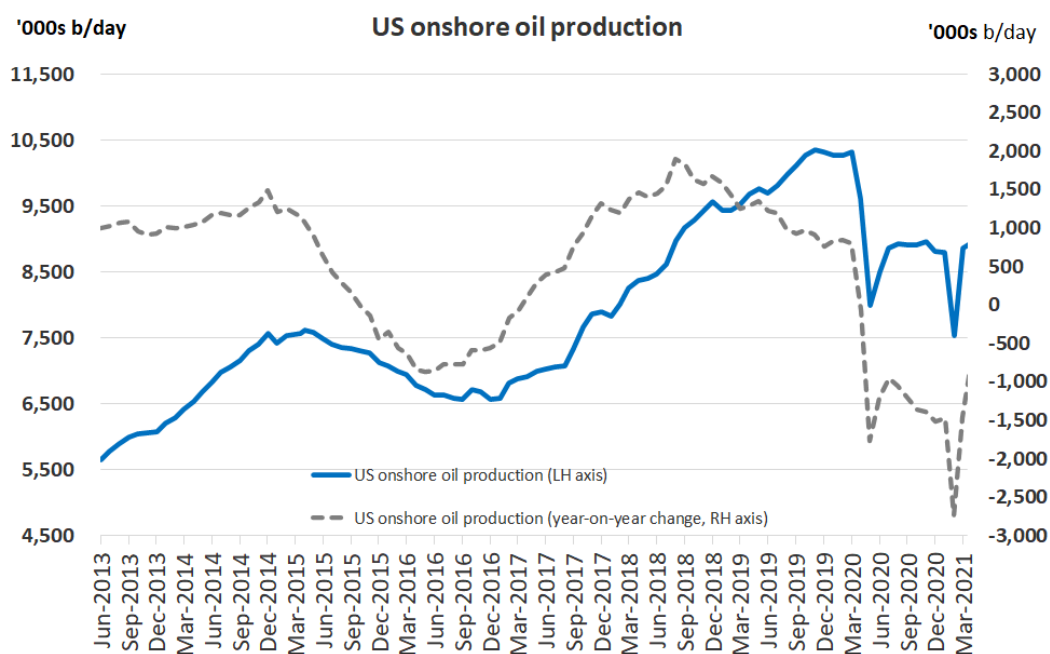
1. Saudi is interested in the average price of oil that they get, they have a longer investment horizon than most other market participants
2. Saudi wants to maintain a balance between global oil supply and demand to maintain a price that is acceptable to both producers and consumers

Nothing in the market in recent years has changed our view that OPEC can put a floor under the price – as they did in 2018, 2016, 2008, 2006, 2001, 1998. Saudi’s desire for a \$60 oil price floor is not dimmed.

**Supply looking forward**

The non-OPEC world has, since the 2008 financial crisis, grown its production more meaningfully than in the seven years before 2008. The growth was 0.9% p.a. from 2001-2008, increasing to 1.8% p.a. from 2008-2019.

Growth in the non-OPEC region since the start of the last decade has been dominated by the development of shale oil and oil sands in North America (up around 7m b/day between since 2010), implying that the rest of non-OPEC region has barely grown over this period, despite the sustained high oil price until mid-2014.



Source: EIA; Guinness Asset Management

The growth in US shale oil production, in particular from the Permian basin, raises the question of how much more there is to come and at what price. Our assessment is that US shale oil is a capital intensive source of oil but one where some growth is viable, on average, at around \$50 oil prices. In particular, there appears to be ample inventory in the Permian basin to allow growth well into the 2020s. The rate of development is heavily dependent on the cashflow available to producing companies, which tends to be recycled immediately into new wells, and the underlying cost of services to drill and fracture the wells. During 2019 and 2020, we started to see increased pressure on US E&P companies to improve their capital discipline and to cut their reinvestment rates, and this is evidenced by higher costs of capital being charged to the US E&P companies.

The collapse in oil prices at the start of 2020 to a level well below \$50/bl changed the landscape, with US E&P companies significantly reducing capital spending as they attempt to live within their cashflows. Despite a recovering oil price since then, the overall reduction in activity will cause US shale supply to decline in 2021.

Non-OPEC supply growth outside the US has been sustained in recent years, despite lower oil prices, since projects that were sanctioned before 2014 (when oil was \$100/bl+) have continued to come onstream. However, the slowdown in investment post 2014 creates the likelihood that non-OPEC (ex-US) production will struggle to grow into the start of the 2020s. On a ten-year view, it is interesting to note that non-OPEC (ex-US) has essentially been flat (excluding the fall in early 2020 as a result of voluntary curtailments amid the COVID-19 demand shock), as new investment has simply offset the decline profiles of existing production.

Looking longer term, other opportunities to exploit unconventional oil likely exist internationally using techniques established in the US, 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 as only being viable at high oil prices.

### **Demand looking forward**

The IEA estimate that 2022 oil demand will rise by around 3m b/day to 99.5m b/day, back close to the 2019 pre-COVID peak. The spread of the COVID virus globally caused major restrictions to the movement of people, which are now lifting.

After a sharp demand recovery in 2021 and 2022, we then expect the world to settle back into oil demand growth of plus or minus 1m b/day, led by increased use in Asia. Historically, China has been the most important component of this growth and continues to be a major component, although signs are emerging that India will also grow rapidly.

In the US, the sharp fall in gasoline prices since 2014 has stimulated a reversal in improving fuel efficiency, as drivers switch back to purchasing larger vehicles, and a rise in total vehicle miles travelled. Total vehicle miles travelled had stalled between 2007 and 2014, after two decades of growth, and are now growing again (ex COVID effects) at a rate of around 1% per year.

The trajectory of global oil demand over the next few years will be a function of global GDP, pace of the 'consumerisation' of developing economies, the development of alternative fuels and price. At a \$50/bl oil price, the world oil bill as a percentage of GDP is around 2.0% and this will still be a stimulant of further demand growth. If oil prices move to a higher range (say around \$75/bbl, representing 3%+ of GDP), we probably return to the pattern established over the past 5 years, with a flatter picture in the OECD more than offset by strong growth in the non-OECD area. Flatter OECD demand reflects improving oil efficiency over time, dampened by

economic, population and vehicle growth. Within the non-OECD, population growth and rising oil use per capita will both play a significant part.

We keep a close eye on developments in the ‘new energy’ vehicle fleet (electric vehicles; hybrids etc), but see little that makes a significant dent on the consumption of gasoline and diesel in the next few years. Sales of electric vehicles (pure electric and plug-in hybrid electrics) globally were around 3.1m in 2020, up from 2.3m in 2019. We expect to see strong EV sales growth again in 2021, up to around 4.4m, or 5% of total global sales. Even applying an aggressive growth rate to EV sales, we see EVs comprising only around 2% of the global car fleet by the end of 2022. Looking further ahead, we expect the penetration of EVs to accelerate, causing global gasoline demand to peak at some point in the middle of the 2020s. However, owing to the weight of oil demand that comes from sources other than passenger vehicles (around 70%), which we expect to continue growing linked to GDP, we expect total oil demand not to peak until around 2030.

### Conclusions about oil

The table below summarises our view by showing our oil price forecasts for WTI and Brent in 2021 versus recent history.

#### Average WTI & Brent yearly prices, and changes

Oil price (inflation adjusted)																					Est
12 month MAV	1986-2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
WTI	30	33	38	49	66	75	82	104	68	84	99	94	98	93	49	45	51	65	57	40	62
Brent	30	32	35	46	64	75	82	103	67	84	115	112	108	99	52	45	54	72	60	42	65
<b>Brent/WTI (12m MAV)</b>	<b>30</b>	<b>33</b>	<b>37</b>	<b>48</b>	<b>65</b>	<b>75</b>	<b>82</b>	<b>104</b>	<b>68</b>	<b>84</b>	<b>107</b>	<b>103</b>	<b>103</b>	<b>96</b>	<b>51</b>	<b>45</b>	<b>53</b>	<b>68</b>	<b>59</b>	<b>41</b>	<b>64</b>
<b>Brent/WTI y-on-y change (%)</b>		8%	12%	30%	37%	15%	9%	26%	-35%	24%	27%	-4%	0%	-7%	-47%	-11%	17%	30%	-14%	-30%	55%
Brent/WTI (5yr MAV)	30	25	32	37	42	51	61	75	79	82	89	93	93	99	92	80	69	63	55	53	57

Source: Guinness Asset Management, Bloomberg

We believe that Saudi’s long-term objective remains to maintain a ‘good’ oil price, something north of \$60/bl. The world oil bill at around \$60/bl represents 2.5% of 2021 Global GDP, 26% under the average of the 1970 – 2015 period (3.4%).

### Natural gas market

#### US gas demand

On the demand side for the US, industrial gas demand and power generation gas demand, each about 25-30% of total US gas demand, are key. Commercial and residential demand, which make up a further quarter, have been fairly constant on average over the last decade – although yearly fluctuations due to the coldness of winter weather can be marked.

#### US natural gas demand

Bcf/day	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021E	2022E
<b>US natural gas demand:</b>											
Residential/commercial	19.2	22.4	23.4	21.4	20.5	20.9	23.4	23.5	21.3	22.2	22.0
Power generation	24.9	22.3	22.3	26.5	27.3	25.3	29.0	30.9	31.7	30.3	31.2
Industrial	19.7	20.3	20.9	20.6	21.1	21.6	23.0	23.0	22.6	23.0	23.6
Pipeline exports (Mexico)	1.8	1.9	1.9	2.7	3.8	4.0	4.6	5.1	5.4	6.1	6.4
LNG exports	-	-	-	0.1	1.0	2.6	3.4	5.7	7.3	10.3	10.9
Pipeline/plant/other	6.1	6.7	6.3	6.5	6.4	6.5	7.1	7.6	7.7	7.8	8.0
<b>Total demand</b>	<b>71.7</b>	<b>73.6</b>	<b>74.8</b>	<b>77.8</b>	<b>80.1</b>	<b>80.9</b>	<b>90.5</b>	<b>95.8</b>	<b>96.0</b>	<b>99.7</b>	<b>102.1</b>
<b>Demand growth</b>	<b>3.1</b>	<b>1.9</b>	<b>1.2</b>	<b>3.0</b>	<b>2.3</b>	<b>0.8</b>	<b>9.6</b>	<b>5.3</b>	<b>0.2</b>	<b>3.7</b>	<b>2.4</b>

Source: Guinness estimates; GS (June 2021)

Industrial demand (of which around 35% comes from petrochemicals) tends to trend up and down depending on the strength of the economy and the differential between US and international gas prices. Electricity gas demand (i.e. power generation) is affected by weather, in particular warm summers which drive demand for air conditioning, but the underlying trend depends on GDP growth and the proportion of incremental new power generation each year that goes to natural gas versus the alternatives of coal, nuclear and renewables. Gas has been taking market share in this sector: in 2020, 33% of electricity generation was powered by gas, up from 22% in 2007. The big loser here is coal which has consistently given up market share.

Total gas demand in 2020 (including Mexican and LNG exports) was around 96.5 Bcf/day, down by 0.6 Bcf/day versus 2019 but 11 Bcf/day (13%) higher than the 5 year average. The biggest contributors to the growth in demand in 2020 were power generation (numerous gas plants increasing gas' share over coal) and LNG exports (opening of new export terminals). Commercial demand for gas was lower, however.

We expect US demand in 2021, assuming prices remain around \$2.75/mcf, to be up by around 4 Bcf/day. The key change is a ramp up of LNG exports (+3 Bcf/day vs 2020, thanks to new terminals coming into full operation and arbitrage between US and European gas prices looking better).

Looking further ahead to 2025, we believe that gas will take a good share of incremental power generation growth in the US and continue to take market share from coal. Our working assumption is for gas fired power generation to grow 0.8-1.2 Bcf/day per year, although this will be affected by actual gas prices. Beyond the mid-2020s, we expect power generation from gas to face stronger competition from renewables.

### US gas supply

Overall, whilst gas demand in the US has been strong over the past five years, it has been overshadowed by a rise in onshore supply, holding the gas price lower.

The supply side fundamentals for natural gas in the US are driven by three main moving parts: onshore and offshore domestic production, pipeline imports of gas from Canada and LNG imports. Of these, onshore supply is the biggest component, making up over 90% of total supply.

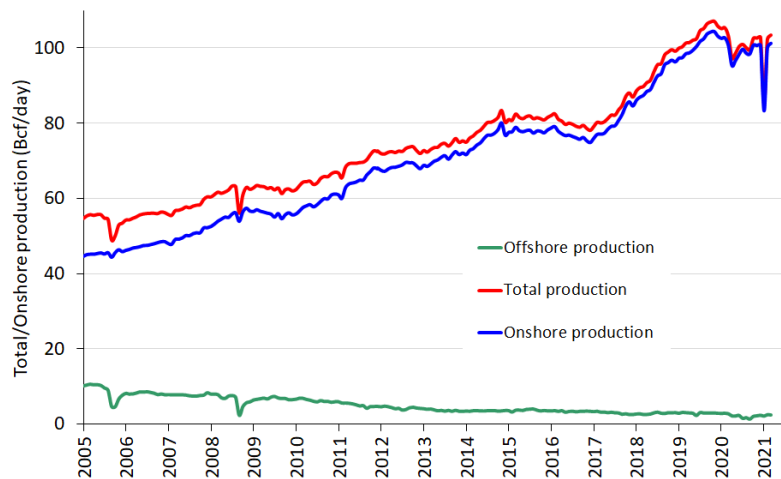
### US natural gas supply

Bcf/day	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021E	2022E
<b>US natural gas supply:</b>											
US (onshore & offshore)	65.7	66.3	70.9	74.2	73.4	73.6	84.0	92.3	92.1	93.0	96.7
Net imports (Canada)	5.4	5.0	4.9	4.9	5.5	5.8	5.4	4.7	4.4	5.3	5.3
LNG imports & other	0.8	0.6	0.5	0.5	0.4	0.3	0.1	0.1	-	-	0.1
<b>Total supply</b>	<b>71.9</b>	<b>71.9</b>	<b>76.3</b>	<b>79.6</b>	<b>79.3</b>	<b>79.7</b>	<b>89.5</b>	<b>97.1</b>	<b>96.5</b>	<b>98.3</b>	<b>102.1</b>
<b>Supply growth</b>	<b>2.4</b>	<b>-</b>	<b>4.4</b>	<b>3.3</b>	<b>- 0.3</b>	<b>0.4</b>	<b>9.8</b>	<b>7.6</b>	<b>- 0.6</b>	<b>1.8</b>	<b>3.8</b>
<b>(Supply)/demand balance</b>	<b>- 0.2</b>	<b>1.7</b>	<b>- 1.5</b>	<b>- 1.8</b>	<b>0.8</b>	<b>1.2</b>	<b>1.0</b>	<b>- 1.3</b>	<b>- 0.5</b>	<b>1.4</b>	<b>-</b>

Source: EIA; Simmons; Guinness estimates

Over the last 10 years, the weaker gas price in the US reflects growing onshore US production driven by rising shale gas and associated gas production (a by-product of growing onshore US oil production). Interestingly, the overall rise in onshore production has come despite a collapse in the number of rigs drilling for gas, which has dropped from a 1,606 peak in September 2008 to 92 at the end of June 2021. However, offsetting the fall, the average productivity per rig has risen dramatically as producers focus their attention on the most prolific shale basins, whilst associated gas from oil production has grown handsomely.

**US natural gross gas production 2005 – 2021 (Lower 48 States)**



Source: EIA 914 data (June 2021 data)

The outlook for gas production in the US depends on three key factors: the rise of associated gas (gas produced from wells classified as oil wells); expansion of the newer shale basins, principally the Marcellus/Utica, and the decline profile of legacy gas fields.

Associated gas production declined in 2020 with the fall of shale oil production, and with US oil supply now flattening, so associated gas production has also moderated. Generally, we expect to see rates of around 2-3 Bcf/day of associated gas per 1m b/day of oil production growth.

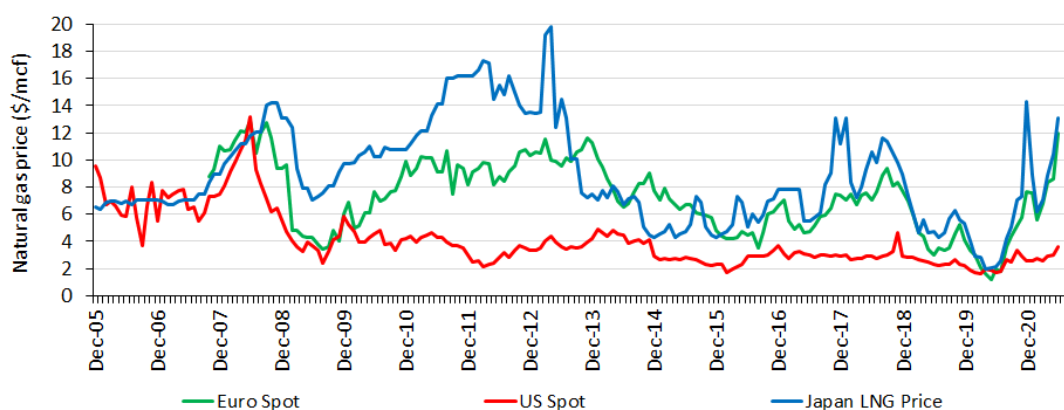
The Marcellus/Utica region, which includes the largest producing gas field in the US and the surrounding region, reached production of around 32 Bcf/day in 2020. Moderate growth is likely in 2021.

Overall, if the price remains in the \$2.50-\$4/mcf range, we expect a small rise in average onshore gas supply in 2021, up by around 1 Bcf/day versus 2020.

**Outlook for US LNG exports – global gas arbitrage**

The prospects for US LNG exports depend on the differentials to European and Asian gas prices, and whether the economic incentive exists to carry out the trade. The UK national balancing point (NBP) gas price – which serves as a proxy to the European traded gas price – has moved to a premium to the US gas price (c.\$10/mcf versus c.\$3.5/mcf). Asian spot LNG prices have also been strong, averaging over \$8/mcf in 2021. The implied economics for US LNG exports into Europe and Asia are attractive assuming international prices are over \$5/mcf.

**International gas prices to June 2021**



Source: Bloomberg (June 2021)

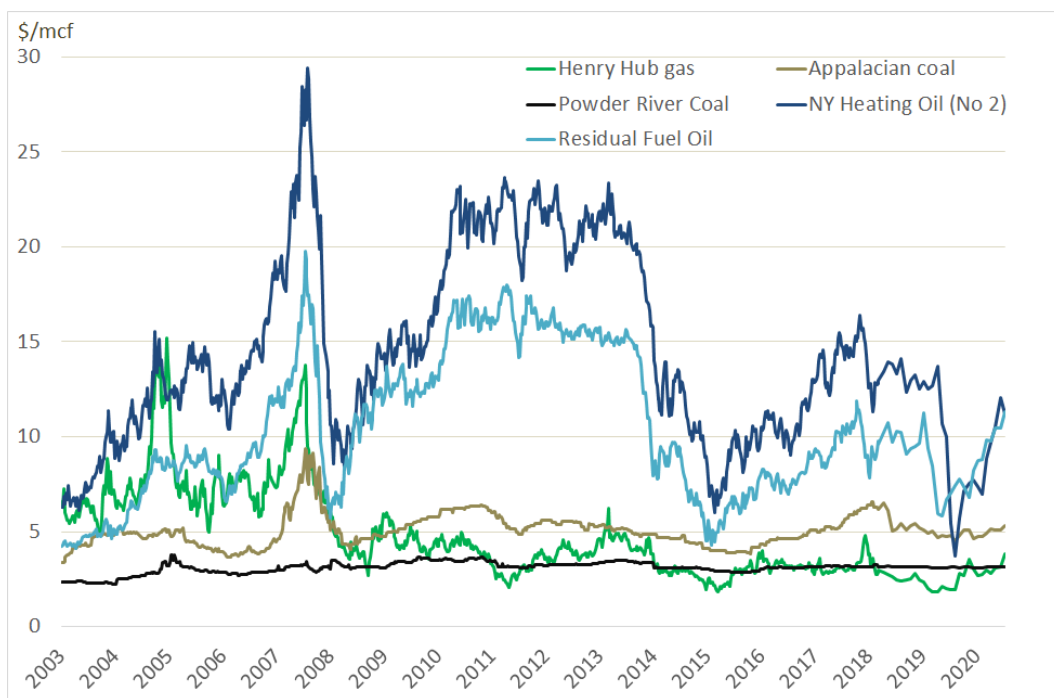


**Relationship with oil and coal**

The oil/gas price ratio (\$ per bbl WTI/\$ per mcf Henry Hub) of around 19x at the end of June 2021 sits above the long-term ratio of c.10x.

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. When the gas price has traded below the coal price support level (2012 and 2016), resulting coal to gas switching for power generation was significant.

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



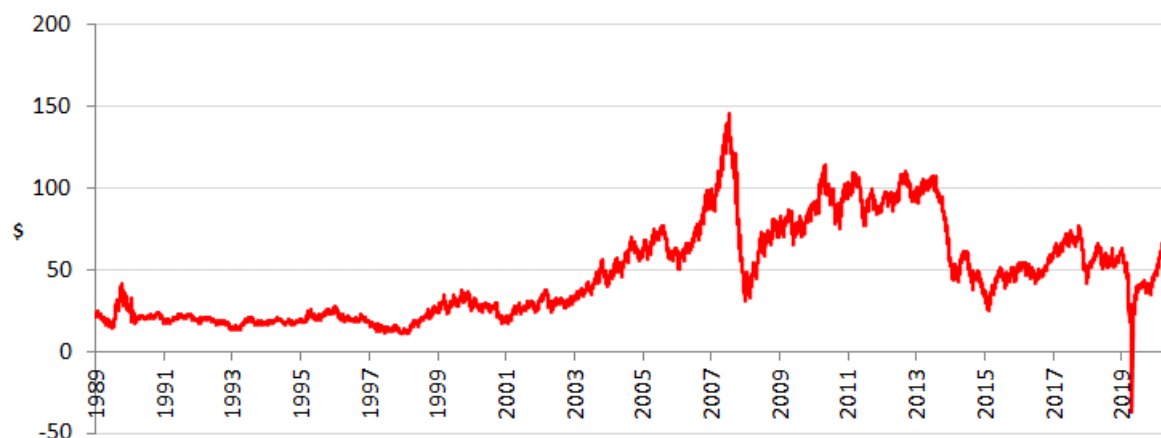
Source: Bloomberg; Guinness Asset Management (June 2021)

**Conclusions about US natural gas**

The US natural gas price was held back over the last decade by continued strength in gas supply, particularly from the Marcellus/Utica and from gas produced as a by-product of shale oil. Natural gas prices averaged \$2.13/mcf in 2020, but we suspect that the (full cycle) marginal cost of supply is now around \$3/mcf. A drop in associated gas supply over the next couple of years, thanks to lower oil prices, should allow gas prices to normalise closer to \$3/mcf, though demand in the short-term is clouded by COVID-19.

## 6. APPENDIX Oil and gas markets historical context

### Oil price (WTI \$) since 1989



Source: Bloomberg LP

For the oil market, the period since the Iraq Kuwait war (1990/91) can be divided into three distinct periods:

- 1) **1990-1998:** 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.
- 2) **1998-2014:** 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.

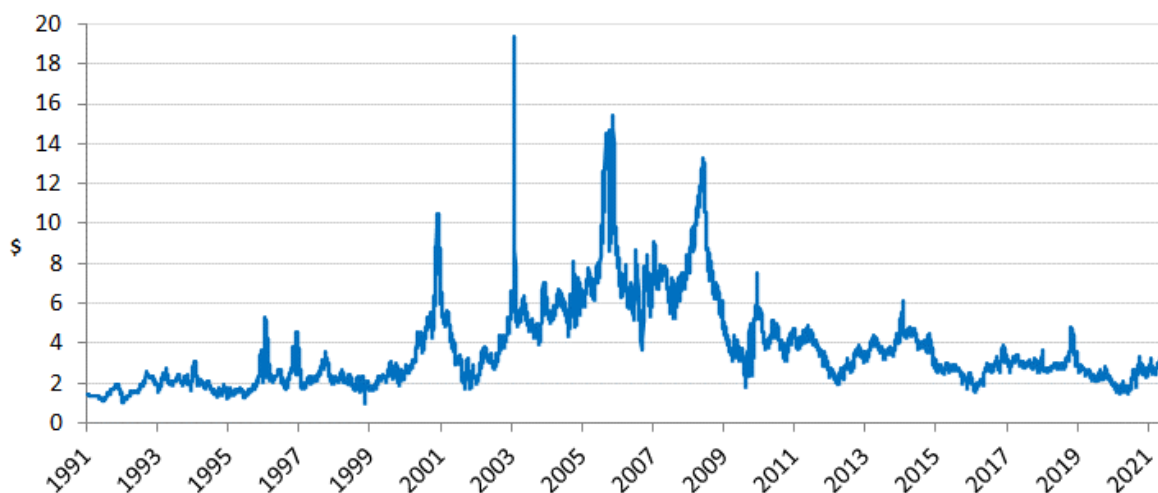
Continued expectations of a supply crunch by the end of the decade, coupled with increased speculative activity in oil markets, contributed to the oil price surging past \$90 in the final months of 2007 and as high as \$147 by the middle of 2008. This spike was brought to an abrupt end by the collapse 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.

Prices during 2011-2014 moved higher, averaging around \$100, though WTI generally traded lower than Brent oil benchmarks due to US domestic oversupply affecting WTI. During this period, US unconventional oil supply grew strongly, but was offset by the pressures of rising non-OECD demand and supply tensions in the Middle East/North Africa.

- 3) **2014-2021:** a further downcycle in oil. Ten years of high prices leading up to 2014 catalysed a wall of new non-OPEC supply, sufficient that OPEC saw no choice but to stop supporting price and re-set the investment cycle. Oil prices found a bottom in 2016 (as a result of OPEC and non-OPEC partners cutting production again), but its recovery was capped by the volume of new supply still coming into the market from projects sanctioned pre the 2014 price crash. Average prices were pinned 2017-19 in the \$50-70/bl range, with prices at the top end of this rang stimulating oversupply from US shale.

The alliance between OPEC and non-OPEC partners fell apart briefly in March 2020 and, coupled with an unprecedented collapse in demand owing to the COVID-19 crisis, oil prices dropped back below \$30/bl, before recovering to around \$50/bl by the end of 2020 thanks to renewed OPEC+ action.

**North American gas price since 1991 (Henry Hub \$/Mcf)**



Source: Bloomberg LP

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, driven by the prolific Marcellus/Utica field and associated gas as a by-product of shale oil 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, though the development of the LNG industry is creating a greater linkage.

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