

Longreach Energy Investments LLC

September 2019 Report

Market and Portfolio Commentary

1.1 Macro Industry Commentary

General Market Commentary

On the 14th September missile and drone attacks on the Khurais Oil Field and Abqaiq Oil Processing facility took out 5.7mmbbl of Saudi Oil supply. The immediate market reaction was a spike in Brent and WTI prices and a moderate increase in HH natural gas. The later was just a carryover of traders buying energy, there being nil structural relationship between Saudi oil supply and the US domestic gas market, and this increase in HH was quickly reversed. By the end of the month the Saudi authorities were reporting that both the Khurais field and the more important Abqaiq plant, had both been repaired and were operating at close to full capacity. The price increases that followed the attack had by this time mostly dissipated with balance 2019 WTI trading at \$54.28/bbl, only \$0.96/bbl higher than level at the start of the month. Future dates also added approximately \$1/bbl. GCM's view is that there is little to no provision for inter-state political or conflict risk in current oil prices.

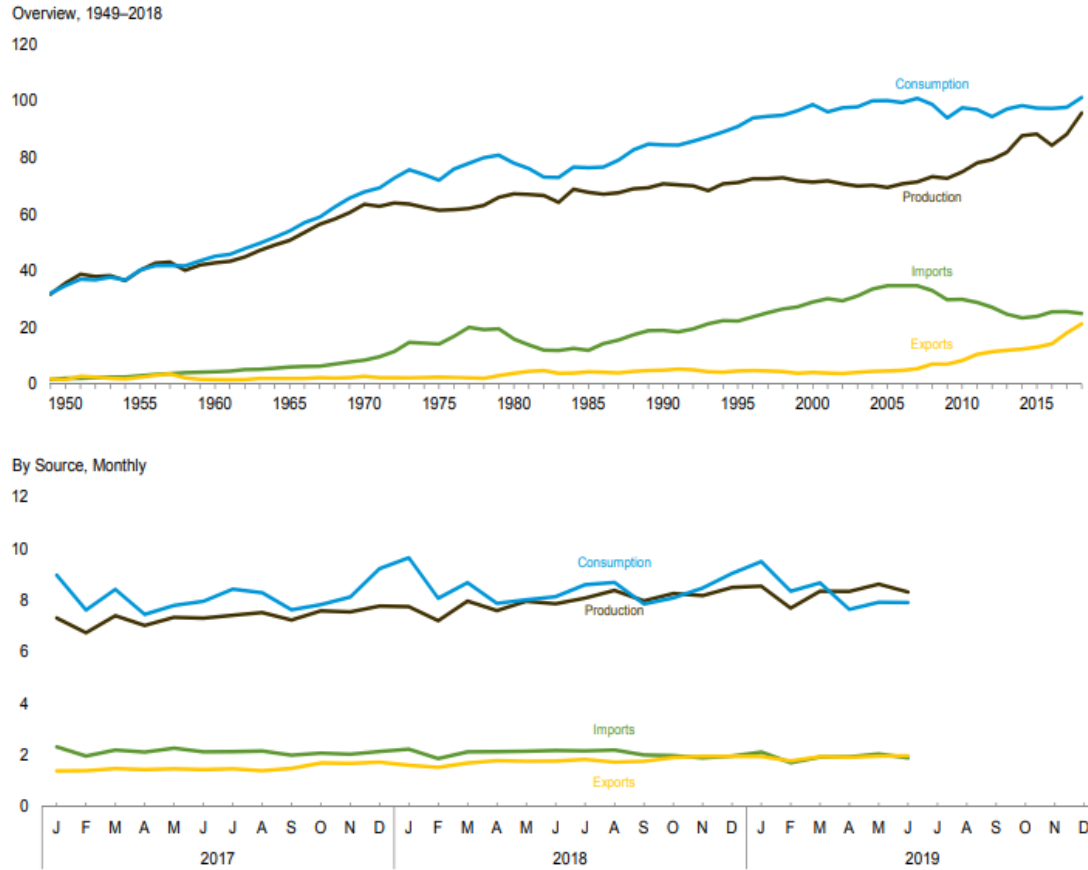
The US-China trade war continues to escalate. In early September the US imposed new 15% tariffs on a variety of Chinese goods, while China retaliated with their own new tariffs on \$75b of goods including a 5% import tariff on US crude oil.

The US Energy Information Agency (EIA) September 2019 Monthly Energy Review provides a comprehensive summary of US energy production and consumption over the last 70 years.

Overall primary energy consumption grew strongly from mid-1980's until early-2000's. Production, having been relatively flat between 1970 and 2006, has grown strongly in the last 10 years to all but erase the US's need for net energy imports.

Figure 1: US Primary Energy Overview (source EIA)

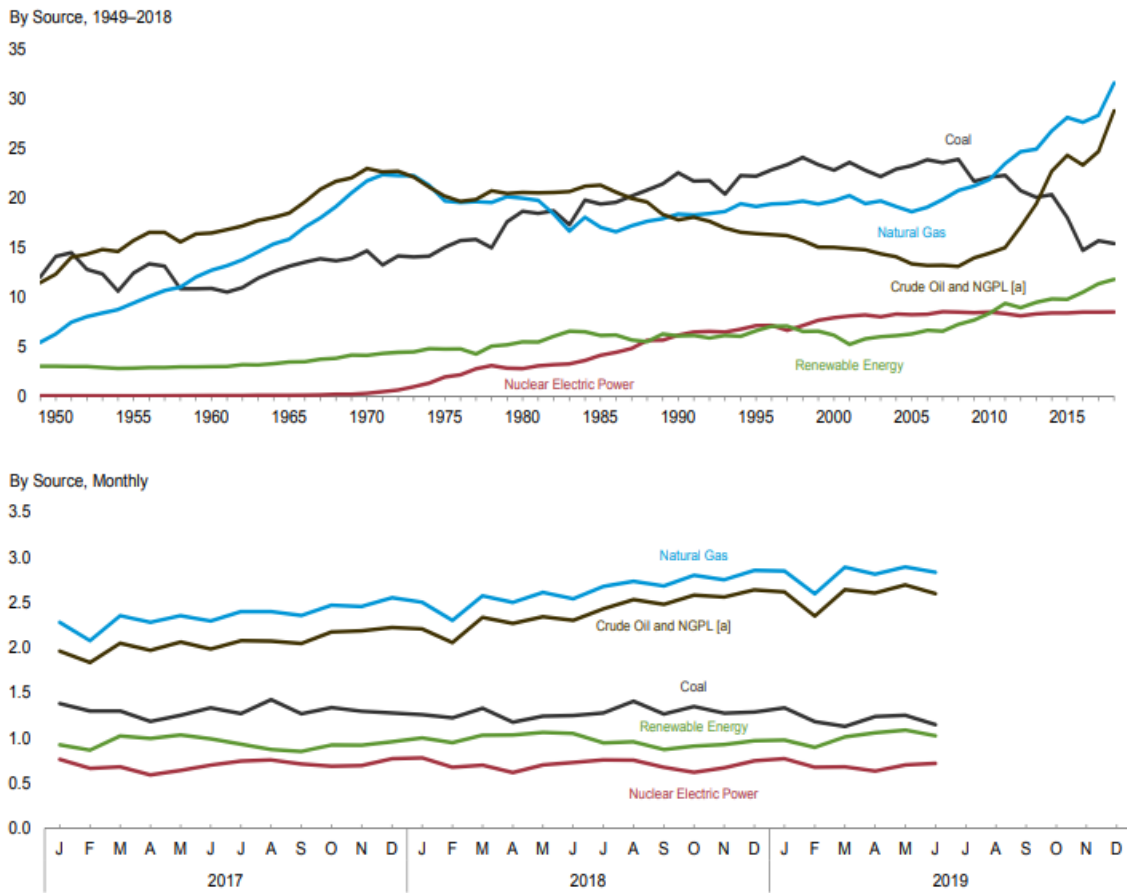
Figure 1.1 Primary Energy Overview
(Quadrillion Btu)



Natural gas and oil production growth have been rapid in the last 10 years, coal production has seen a substantial decline, while renewable growth has been steady and nuclear electric power flat.

Figure 2: US Primary Energy Production (source EIA)

Figure 1.2 Primary Energy Production
(Quadrillion Btu)

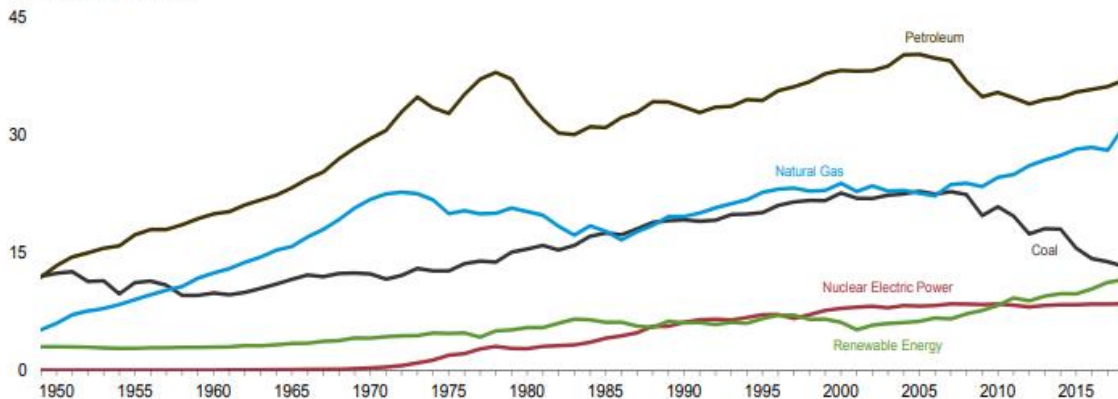


Natural gas consumption is at an all-time high and growing strongly. Monthly data shows the strong seasonality in natural gas demand with peaks driven by need for winter heating. Petroleum consumption is down from its peak in mid-2000's and below the level of the late-1970's.

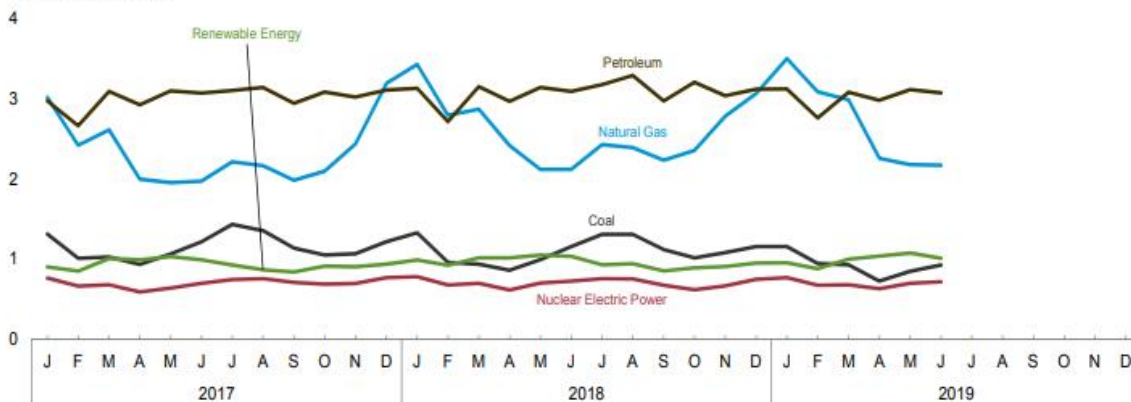
Figure 3: US Primary Energy Consumption (source EIA)

Figure 1.3 Primary Energy Consumption
(Quadrillion Btu)

By Source, [a] 1949–2018



By Source, [a] Monthly

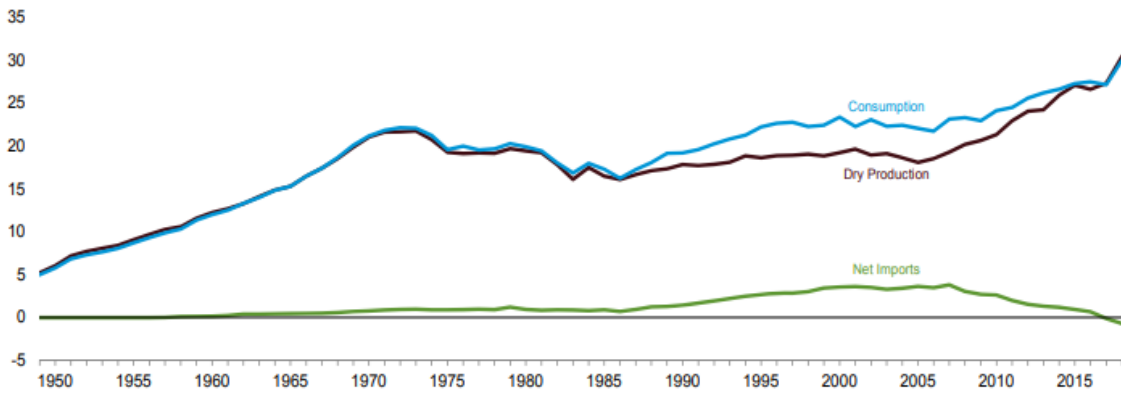


Electrical power and industrial uses consume the highest volumes of natural gas with demand growth driven by electric power (primarily switching from coal).

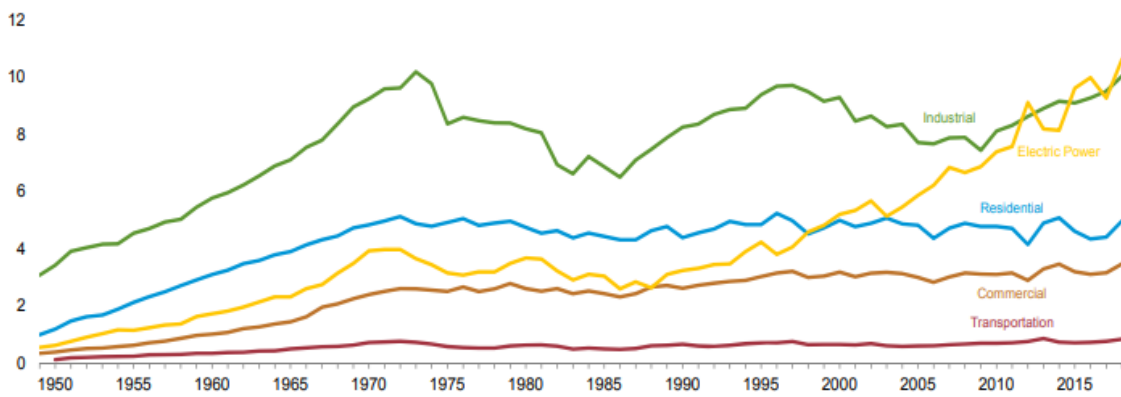
Figure 4: US Natural Gas Overview (source EIA)

Figure 4.1 Natural Gas
(Trillion Cubic Feet)

Overview, 1949–2018



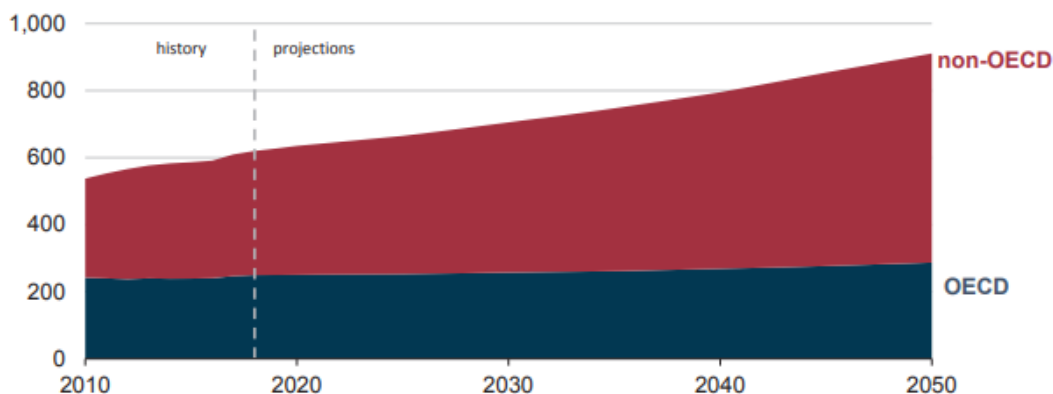
Consumption by Sector, 1949–2018



The EIA also published its 2019 International Energy Outlook during September. Key slides and observations are copied below. The overall summary is that energy demand growth is to be driven by non-OECD countries and particularly in Asia, end use consumption continues to shift toward electricity and while by 2050 renewable energy is largest source of supply, absolute levels of consumption for all primary energy sources are higher in 2050 than they are today.

World energy consumption rises nearly 50% between 2018 and 2050 in the Reference case —

World energy consumption
quadrillion British thermal units

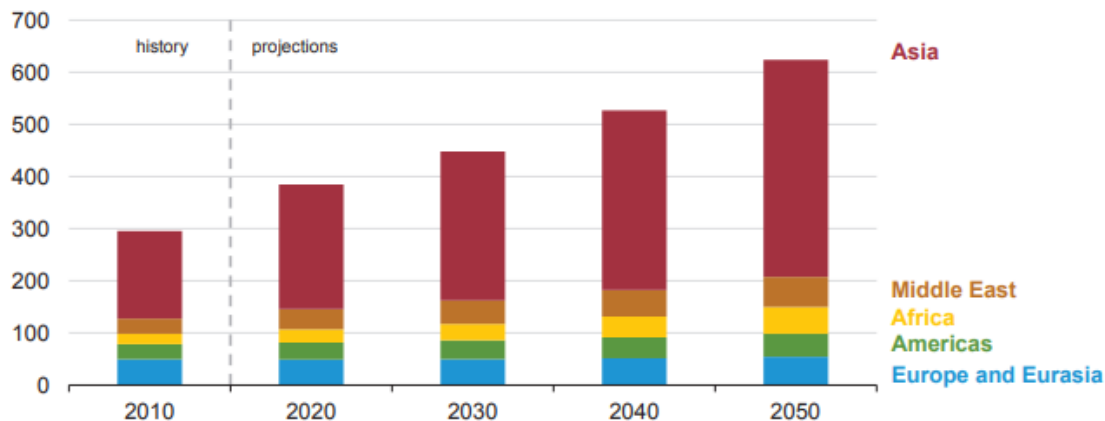


—with almost all of the increase occurring in non-OECD countries

- In the Reference case, most increases in energy consumption come from non-OECD countries, where strong economic growth, increased access to marketed energy, and rapid population growth lead to rising energy consumption.
- In OECD countries, growth in energy consumption is slower as a result of relatively slower population and economic growth, improvements in energy efficiency, and less growth in energy-intensive industries.
- Energy consumption in non-OECD countries increases nearly 70% between 2018 and 2050 in contrast to a 15% increase in OECD countries.

In the Reference case, non-OECD Asia accounts for most of the increase in energy use—

Non-OECD energy consumption by region
quadrillion British thermal units



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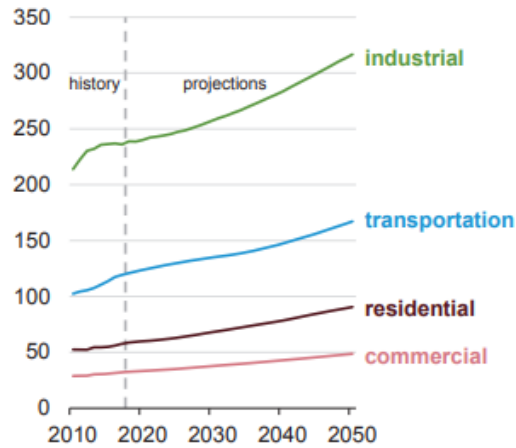
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—but substantial growth also occurs in other non-OECD regions

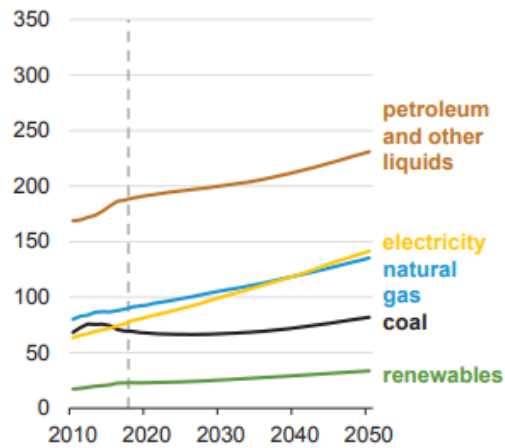
- More than half of the projected increase in global energy consumption occurs in non-OECD Asian countries, a group that includes China and India. Energy demand in non-OECD Asia is larger than in any other region in 2018, and it is projected to almost double between 2018 and 2050, making it both the largest and fastest-growing region in the world for energy consumption.
- China and India have been among the world's fastest-growing economies during much of the past decade, and they remain primary contributors to future growth in world energy demand.
- Non-OECD regions outside of Asia contribute to substantial increases in energy consumption. Fast-paced population growth and access to ample domestic resources are important determinants of energy demand in Africa and the Middle East, where energy use increases about 110% and 55%, respectively, between 2018 and 2050.
- Non-OECD Europe and Eurasia has the smallest projected increase in energy consumption (11%). Much of the low growth is related to Russia, where the population declines. The low growth is also a result of significant gains in energy efficiency achieved by replacing older physical assets with more efficient ones.

While energy consumption in each end-use sector grows—

End-use energy consumption by sector, world
quadrillion British thermal units



End-use energy consumption by fuel, world
quadrillion British thermal units



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—end-use fuel composition increasingly shifts toward electricity

- End-use fuels include those fuels consumed in the industrial, transportation, and buildings sectors and exclude fuels used for electric power generation.
- Liquid fuels, because of energy density, cost, and chemical properties, continue to be the predominant transportation fuel and an important industrial feedstock.
- Electricity use in the residential and commercial building sectors increases rapidly because of growing income, a growing population, and increased access to electricity in non-OECD regions.
- Electricity use in the industrial sector and transportation sector also grows, respectively, as a result of increasing product demand and increasing use of electric vehicles.
- Coal continues to be an important end-use fuel in industrial processes, including the production of cement and steel.

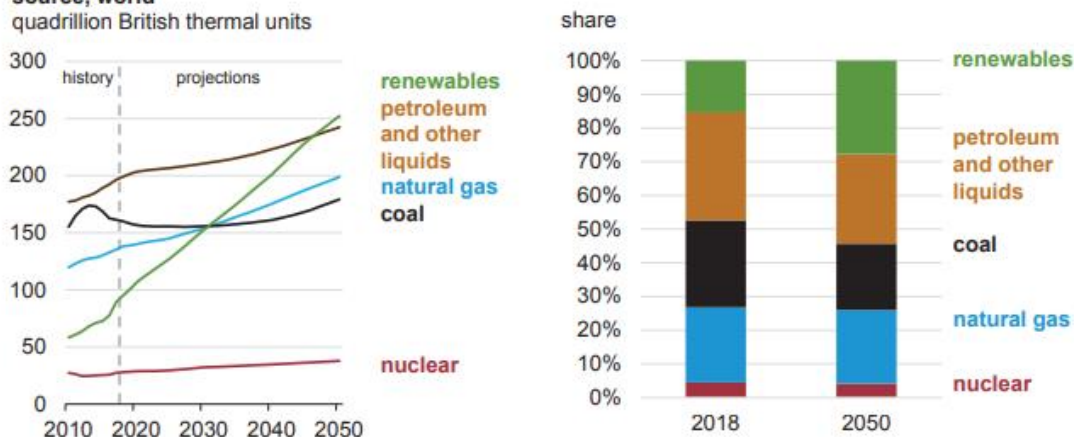
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Renewable energy becomes the leading source of primary energy consumption by 2050 in the Reference case—

Primary energy consumption by energy source, world
quadrillion British thermal units



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—although consumption increases for all primary energy sources

- Use of all primary energy sources grows throughout the Reference case. Although renewable energy is the world's fastest growing form of energy, fossil fuels to continue to meet much of the world's energy demand.
- Driven by electricity demand growth and economic and policy drivers, worldwide renewable energy consumption increases by 3% per year between 2018 and 2050. Nuclear consumption increases by 1% per year.
- As a share of primary energy consumption, petroleum and other liquids declines from 32% in 2018 to 27% in 2050. On an absolute basis, liquids consumption increases in the industrial, commercial, and transportation sectors and declines in the residential and electric power sectors.
- Natural gas is the world's fastest growing fossil fuel, increasing by 1.1% per year, compared with liquids' 0.6% per year growth and coal's 0.4% per year growth.
- Coal use is projected to decline until the 2030s as regions replace coal with natural gas and renewables in electricity generation as a result of both cost and policy drivers. In the 2040s, coal use increases as a result of increased industrial usage and rising use in electric power generation in non-OECD Asia excluding China.

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Baker Hughes US rig count data show 710 active oil rigs and 144 active gas rigs as at 4 October. Oil rigs are down 44 in the last month and 151 from September 2018. Gas rigs are down 18 in the last month and 45 from September 2018.

Despite the precipitous drop in oil rigs this year, the large (but declining) inventory of Drilled Uncompleted wells (DUCs) together with improved rig efficiency and well productivity, are expected to see oil output from the top US shale basins to rise by 74mmbld (thousand barrels per day) to about 8.84mmbld (million barrels

per day). US gas production is also breaking records, reaching 93bcfd during late September thanks to new pipelines providing transport for Permian basin gas.

While it will take time, lower rig counts will ultimately lead to lower production.

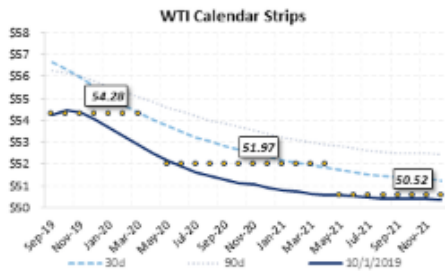
Gas Market

Gas prices have been flat month-on-month with winter-season storage withdrawals not likely to commence until November or December.

Oil Market

As was commented upon above, notwithstanding the attack on Saudi oil infrastructure, oil prices finished the month only modestly higher than they started. The principal negative for oil prices remains relatively low international GDP growth and the ongoing US-China trade war.

Gas and Oil Prices 1 October 2019



Swap Pricing

	Bal 19	Cal 20	Cal 21	Cal 22
NYMEX WTI Crude	\$ 54.28	\$ 51.97	\$ 50.52	\$ 50.48
ICE Brent Crude	\$ 59.06	\$ 57.13	\$ 56.12	\$ 56.24
Louisiana Light Sweet	\$ 57.38	\$ 54.79	\$ 53.15	\$ 53.28
TM Midland Differential	\$ 0.57	\$ 0.65	\$ 0.70	
NYMEX Natural Gas	\$ 2.41	\$ 2.41	\$ 2.44	\$ 2.49

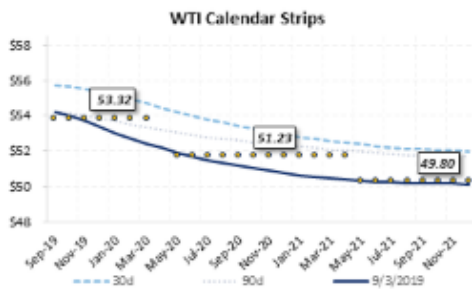
Source: Bloomberg LP
Note: Midland diff changed to TM computation Oct 1. All prices indicative only.

Natural Gas Basis

Location	Spot	Summer '19	Winter '19/'20	Summer '20
Henry Hub Fixed	\$2.37	\$ 2.43	\$ 2.51	\$ 2.32
MichCon	\$ (0.58)	\$ (0.49)	\$ (0.15)	\$ (0.23)
TETCO M3	\$ (0.72)	\$ (0.97)	\$ 1.64	\$ (0.37)
Dominion S	\$ (0.76)	\$ (1.07)	\$ (0.40)	\$ (0.49)
TETCO M2	\$ (0.77)	\$ (1.10)	\$ (0.41)	\$ (0.54)
CIG	\$ (0.85)	\$ (0.74)	\$ (0.46)	\$ (0.68)
NGPL-Midcon	\$ (0.90)	\$ (0.75)	\$ (0.44)	\$ (0.51)
Waha	\$ (1.18)	\$ (0.83)	\$ (0.99)	\$ (1.48)

All prices as of close yesterday

Gas and Oil Prices 3 September 2019



Swap Pricing

	Bal 19	Cal 20	Cal 21	Cal 22
NYMEX WTI Crude	\$ 53.32	\$ 51.23	\$ 49.80	\$ 49.67
ICE Brent Crude	\$ 56.87	\$ 55.56	\$ 55.14	\$ 55.43
Louisiana Light Sweet	\$ 55.79	\$ 53.74	\$ 52.20	\$ 52.05
TM Midland Differential	\$ 0.29	\$ 0.40	\$ 0.60	
NYMEX Natural Gas	\$ 2.38	\$ 2.41	\$ 2.47	\$ 2.53

Source: Bloomberg LP
Note: Midland diff changed to TM computation Oct 1. All prices indicative only.

Natural Gas Basis

Location	Spot	Summer '19	Winter '19/'20	Summer '20
Henry Hub Fixed	\$2.34	\$ 2.29	\$ 2.49	\$ 2.31
MichCon	\$ (0.34)	\$ (0.30)	\$ (0.12)	\$ (0.19)
NGPL-Midcon	\$ (0.79)	\$ (0.54)	\$ (0.32)	\$ (0.45)
TETCO M3	\$ (0.84)	\$ (0.62)	\$ 1.33	\$ (0.33)
Dominion S	\$ (0.85)	\$ (0.75)	\$ (0.37)	\$ (0.44)
TETCO M2	\$ (0.88)	\$ (0.79)	\$ (0.38)	\$ (0.48)
CIG	\$ (0.89)	\$ (0.60)	\$ (0.35)	\$ (0.64)
Waha	\$ (0.97)	\$ (0.67)	\$ (0.67)	\$ (1.19)

All prices as of close yesterday