

QGR Trust

- Longreach Energy Investments LLC

February 2020 Report

1.0 Market and Portfolio Commentary

1.1 Macro Industry Commentary

General Market Commentary

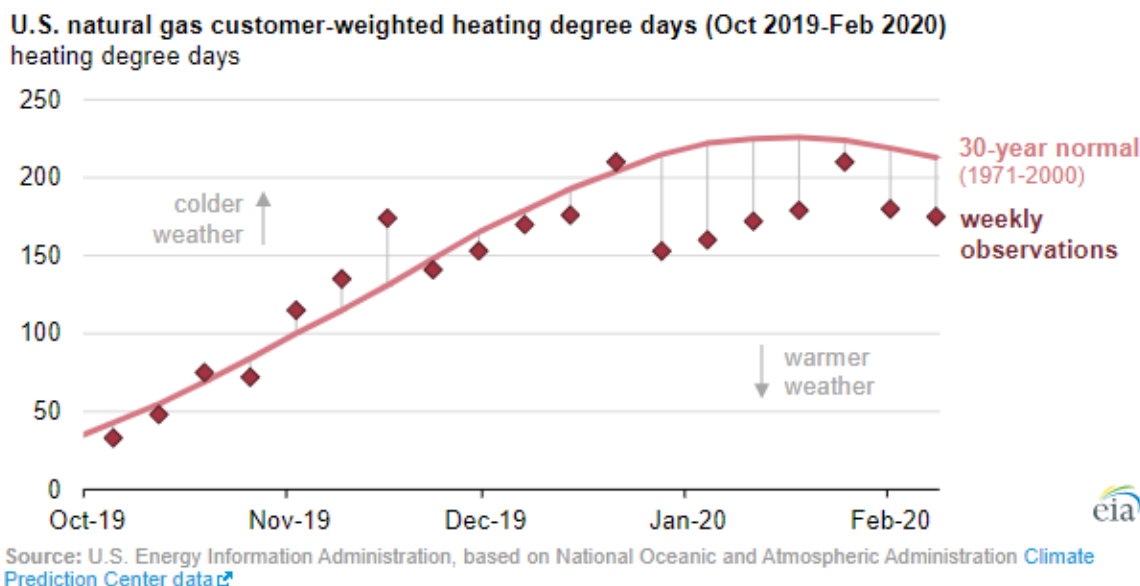
Market fears of the impact of the coronavirus escalated steadily during the February. By the first week of March commodity and financial markets had all been significantly impacted (govt bond prices up, gold up a bit, pretty much everything else down). Oil was the standout loser (near dated contracts down over 30%, see Figure 1) thanks to what appears to be a complete breakdown in relationship between OPEC (well, Saudi Arabia) and Russia during OPEC+ meetings in Vienna on 5 and 6 March. Russia refused to agree to additional supply cuts to offset coronavirus demand losses. This appears to be a strategic attempt by Russia to hurt US shale producers, many of whom have too much debt and little prospect of new equity capital. The Saudi reaction, a significant increase to production and reported offers to supply to, primarily Russian, crude buyers oil at deeply discounted prices may encourage Russia back to the table, though in the near term all oil producers are going to feel real pain. Those who will prosper in this period are investors who can endure with minimal (or no) debt, no unfunded capital commitments and the ability to close the acquisition of high-quality assets at very low prices.

US gas prices initially fell by a modest 4 to 6%, as detailed in Figure 1, although note that these falls were off an already low base due to high production and low demand after a relatively warm winter (Figure 2 shows US Heating Degree Days from Oct 2019 to Feb 2020, higher heating degree days equals increased heating induced demand).

Figure 1: 9 March 1500 AEDT Live WTI and HH Price Strips (source CME Group)

	WTI	Change	Change	HH	Change	Change
	\$/bbl	\$/bbl	%	\$/mmbtu	\$/mmbtu	%
Apr-20	\$27.95	-\$13.33	-32%	\$1.61	-\$0.094	-6%
May-20	\$28.38	-\$13.13	-32%	\$1.66	-\$0.085	-5%
Jun-20	\$29.03	-\$12.74	-31%	\$1.74	-\$0.079	-4%
Jul-20	\$29.75	-\$12.29	-29%	\$1.83	-\$0.076	-4%
Aug-20	\$30.33	-\$12.00	-28%	\$1.87	-\$0.072	-4%
Sep-20	\$30.89	-\$11.75	-28%	\$1.88	-\$0.071	-4%
Oct-20	\$31.70	-\$11.22	-26%	\$1.93	-\$0.066	-3%
Nov-20	\$33.31	-\$9.93	-23%	\$2.08	-\$0.060	-3%
Dec-20	\$33.08	-\$10.48	-24%	\$2.31	-\$0.045	-2%
2021	\$38.98	-\$7.38	-16%	\$2.32	\$0.000	0%
2022	\$41.88	-\$5.94	-12%	\$2.38	\$0.000	0%
2023	\$43.50	-\$5.43	-11%	\$2.54	\$0.000	0%
2024	\$45.20	-\$4.38	-9%	\$2.56	\$0.000	0%
2025	\$47.60	-\$2.36	-5%	\$2.60	\$0.000	0%

Figure 2: US Heating Degree Days (source EIA)



By 0730 AEDT on 10 March the diversification benefits of investing in both natural gas and oil had started to become clear with natural gas bouncing by up to 15% from previous day (see Figure 3). The markets appear to recognise that the collapse in oil prices will significantly reduce the production of gas associated with oil (“associated gas”). As oil drilling activity falls, on top of already falling pure dry gas production because of low prices, this could lead to supply shortfalls by the second half of 2020.

Figure 3: 10 March 0730 AEDT Live WTI and HH Price Strips (source CME Group)

7.30am 10/3	WTI	Change	Change	HH	Change	Change
	\$/bbl	\$/bbl	%	\$/mmbtu	\$/mmbtu	%
Apr-20	\$30.97	\$3.02	12%	\$1.82	\$0.21	15%
May-20	\$31.38	\$3.00	12%	\$1.87	\$0.20	14%
Jun-20	\$31.95	\$2.92	11%	\$1.94	\$0.21	14%
Jul-20	\$32.48	\$2.73	10%	\$2.04	\$0.21	13%
Aug-20	\$33.18	\$2.85	10%	\$2.07	\$0.20	12%
Sep-20	\$33.85	\$2.96	11%	\$2.09	\$0.21	12%
Oct-20	\$34.33	\$2.63	9%	\$2.13	\$0.20	12%
Nov-20	\$35.02	\$1.71	5%	\$2.28	\$0.20	11%
Dec-20	\$35.65	\$2.57	8%	\$2.50	\$0.19	9%
2021	\$39.00	\$0.02	0%	\$2.40	\$0.08	4%
2022	\$44.35	\$2.47	6%	\$2.39	\$0.01	0%
2023	\$45.75	\$2.25	5%	\$2.54	\$0.00	0%
2024	\$46.20	\$1.00	2%	\$2.56	\$0.00	0%
2025	\$45.42	-\$2.18	-4%	\$2.60	\$0.00	0%

Longreach Energy has for the last year or so been underwriting deals at a \$2.00 to \$2.25 gas price and \$45 to \$50 oil. If oil stays low, we will see a reduction in income and some impact on valuations but with current portfolio weighting of over 70% gas provides significant protection. Also helping is that the portfolio’s principal oil exposure delivers robust returns of over 25% at \$40/bbl flat (see Figure 4).

Figure 4: TAPP Permian Basin Return Sensitivities (source Longreach Energy)

	\$30/bbl flat	\$35/bbl flat	\$40/bbl flat	original case
	NPV10 \$m	NPV10 \$m	NPV10 \$m	NPV10 \$m
PV-DP	3.3	5.9	8.8	19.6
PV-BP	0.2	1.3	2.4	6.1
PV-UD	2.4	7.7	13.1	28.6
PB-UD	16.5	56.5	96.5	214.2
PS-UD	10.1	42.8	75.6	176.9
	\$30/bbl flat	\$35/bbl flat	\$40/bbl flat	original case
	IRR	IRR	IRR	IRR
PUD Well	13.0%	20.3%	28.4%	53.1%

Natural gas supply growth in recent years has mainly been driven by dry-gas production in Appalachia and associated gas production across the oil prone shale basins (e.g. Permian, Bakken, Eagle Ford, Niobrara and Mid-Continent). Data are shown in Figure 5 from Raymond James.

Figure 5: US Dry Gas Production Y/Y Growth (source Raymond James NAPE 2020 Presentation)

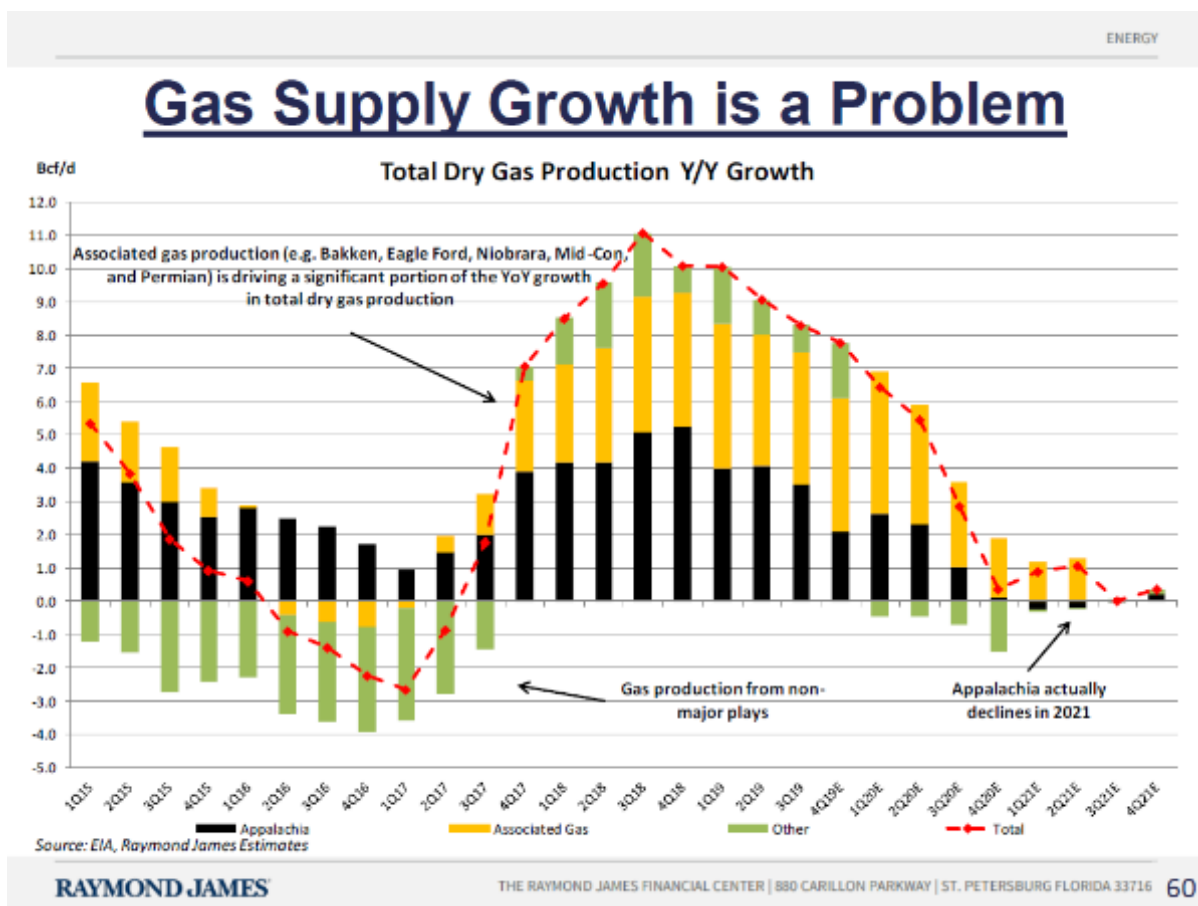
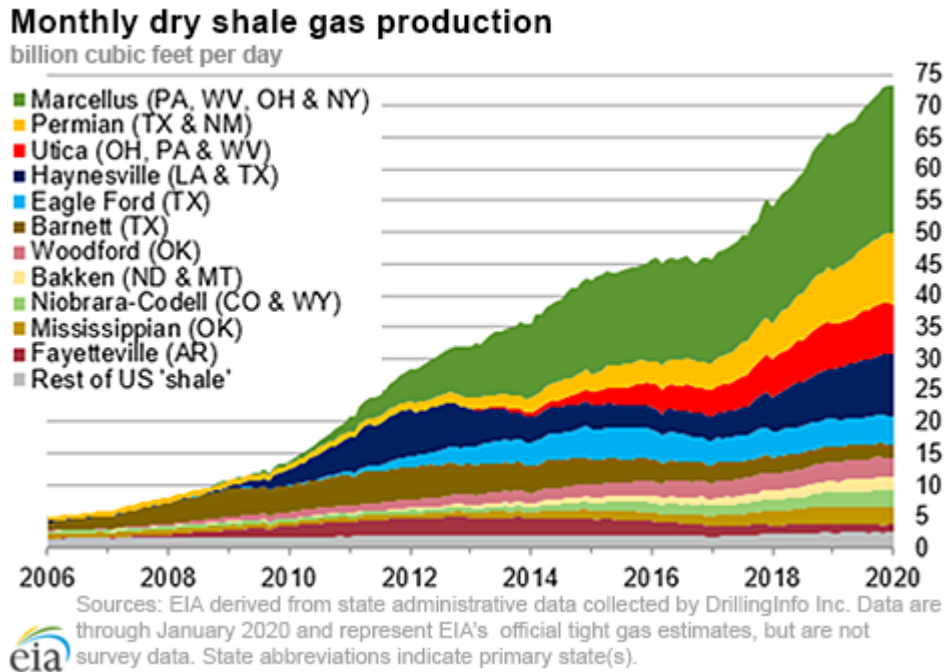


Figure 6 has most recent EIA regional production data highlighting importance of Appalachia (Marcellus and Utica), Permian and Haynesville.

Figure 6: US Monthly Dry Gas Production (source EIA)




As noted in the Longreach Energy January 2020 monthly report the fall in rig rates and well completions are now being seen in supply data. The EIA continues to revise down 2020 forecast US natural gas production, from the EIA short term energy outlook on 11 Feb:

...EIA expects monthly production to generally decline through 2020, falling from an estimated 95.4 bcf/d in January to 92.5bcf/d in December. The falling production mostly occurs in the Appalachian and Permian regions. In the Appalachian region, low natural gas prices are discouraging natural gas-directed drilling, and in the Permian, low oil prices are expected to reduce associated gas output from oil-directed wells.

If oil stays in the ~\$30 to mid-\$40/ bbl range for longer than a couple of months, then the fall in associated gas production above that forecast by the EIA could be pronounced. This will be very beneficial to gas prices.

While export volumes delivered through LNG to the world and pipeline gas to Mexico are increasing, they currently average only approximately 11bcfd vs ~93bcf/d of production. Accordingly, US natural gas prices are still mostly driven by domestic factors. Here the effect of lower prices on reducing supply (seen through low rig counts as detailed in Figure 7) and increasing demand (absent of weather effects the demand for power generation is increasing with switching from coal to gas), can be expected to flow through the market faster than in the more international and geo-politically complex oil industry.

Figure 7: US Rig Count (source Baker Hughes)

Baker Hughes rig count **Baker Hughes** 

Rotary Rig Count
2/28/20

Location	Week	+/-	Week Ago	+/-	Year Ago
Land	767	-1	768	-248	1015
Inland Waters	1	0	1	0	1
Offshore	22	0	22	0	22
United States Total	790	-1	791	-248	1038
Gulf Of Mexico	22	0	22	0	22
Canada	240	-4	244	29	211
North America	1030	-5	1035	-219	1249
U.S. Breakout Information	This Week	+/-	Last Week	+/-	Year Ago
Oil	678	-1	679	-165	843
Gas	110	0	110	-85	195
Miscellaneous	2	0	2	2	0
Directional	46	1	45	-21	67
Horizontal	708	-6	714	-203	911
Vertical	36	4	32	-24	60

Also supporting gas prices is the fact that despite the relatively warm summer and high production, gas storage levels, while up on last year, are well within the within five-year average.

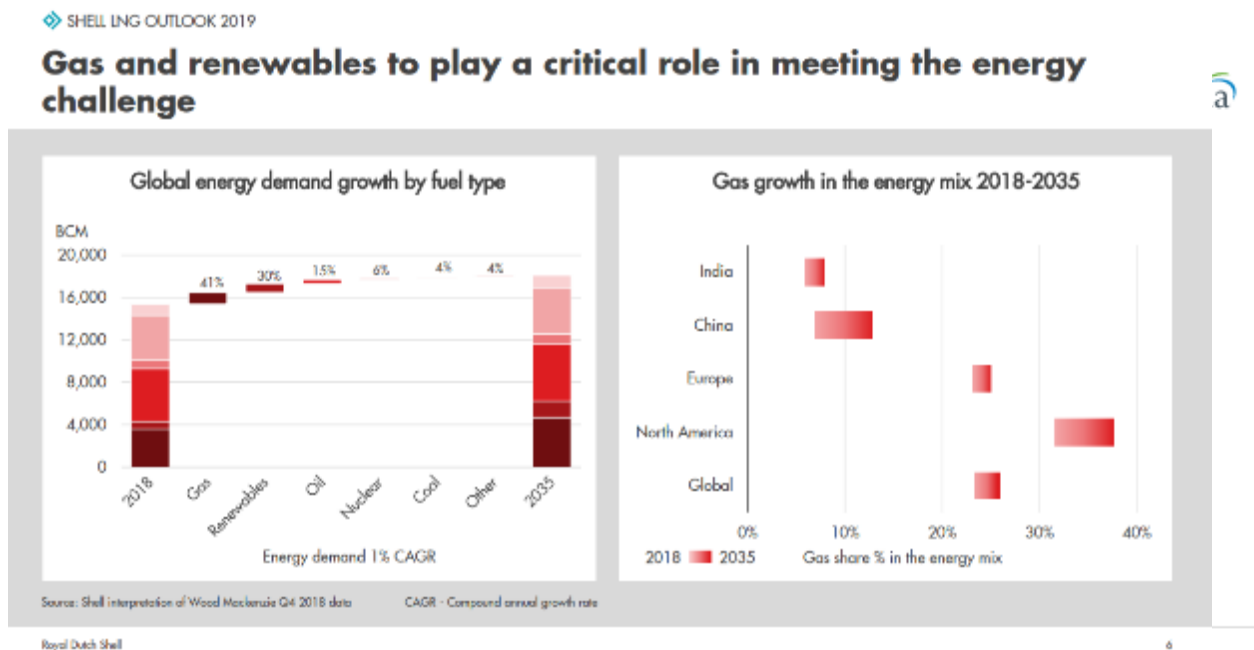


Figure 8: US Lower 48 Working Gas in Storage Oct 2019 – Apr 2020 (source EIA)

During February Shell released its 2019 LNG Outlook. A selection of relevant slides is provided below. While we remain alert to confirmation bias, the data all support the fundamental thesis that the world requires more gas and that the LNG market will continue to grow.

SHELL LNG OUTLOOK 2019

The energy challenge

Growing population

According to United Nations estimates, the current world population of 7.6 billion is expected to reach 8.6 billion in 2030, 9.7 billion in 2050 and 11.2 billion in 2100. Nearly a billion people still live without electricity while another billion struggle with unreliable supplies of electricity.

Rising demand

By 2070 the world is likely to be using at least 50% more energy than it does today as population grows and people seek to improve their quality of life.

Need for energy solutions

According to the International Energy Agency (IEA), renewable generation is expected to underpin the growth of electricity from 18% to 50% of energy supply by 2050. The remaining energy demand that is difficult to electrify will still require cleaner solutions.

Mitigating climate change

The world currently emits 33 billion tonnes of energy-related CO₂ each year. To limit the rise in global temperature to 2°C, the IEA has calculated that energy-related CO₂ emissions need to fall to around 18 billion tonnes a year by 2060. The challenge is not just to reduce emissions, but to do this while providing more reliable energy supplies.

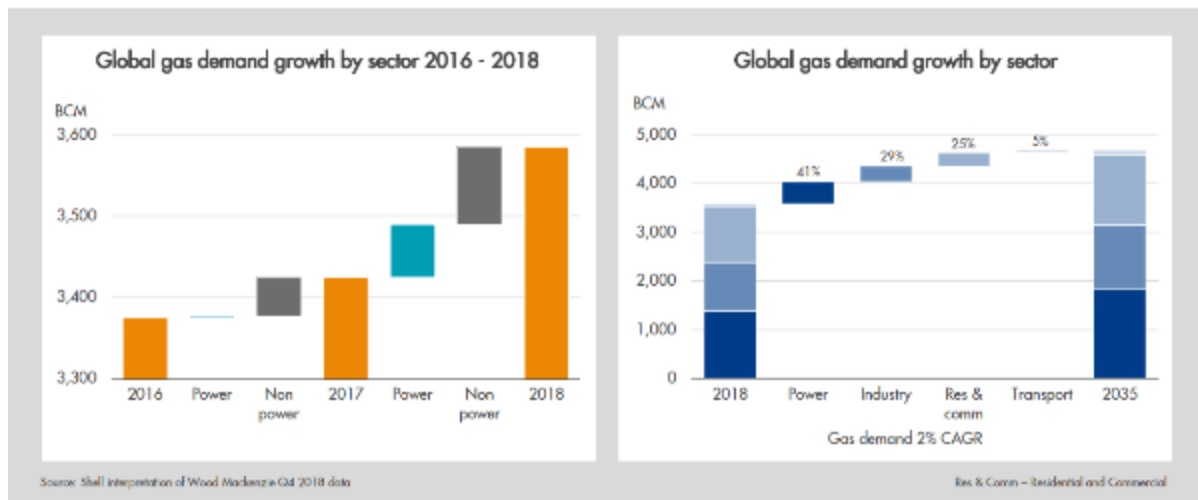
Improving air quality

Updated World Health Organization (WHO) estimates reveal an alarming death toll of 7 million people every year caused by outdoor and household air pollution. According to WHO, global air pollution is linked to inefficient energy use in every sector of human activity including coal-fired power plants, industry, agriculture and transport.

Royal Dutch Shell

◆ SHELL LNG OUTLOOK 2019

Gas demand growth not reliant on the power sector

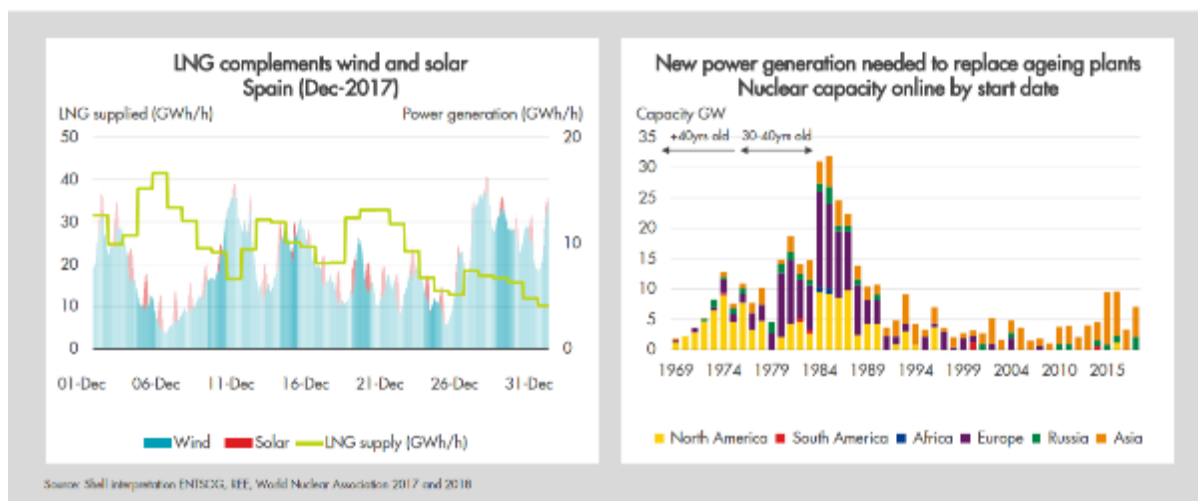


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Gas provides required flexibility for power generation

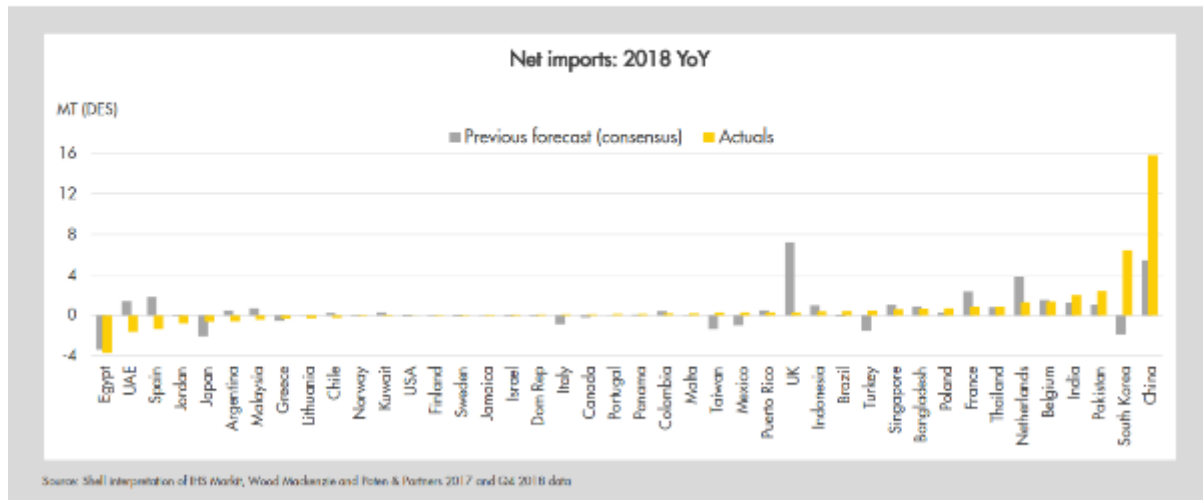


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LNG imports increased by 27 MT in 2018

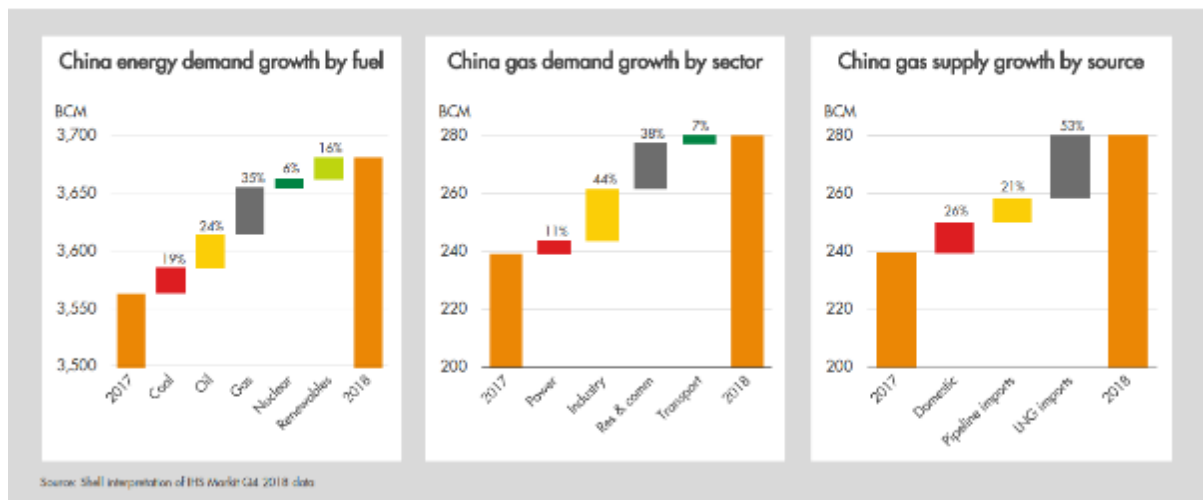


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LNG imports continued to enable China to meet its growing need for cleaner energy

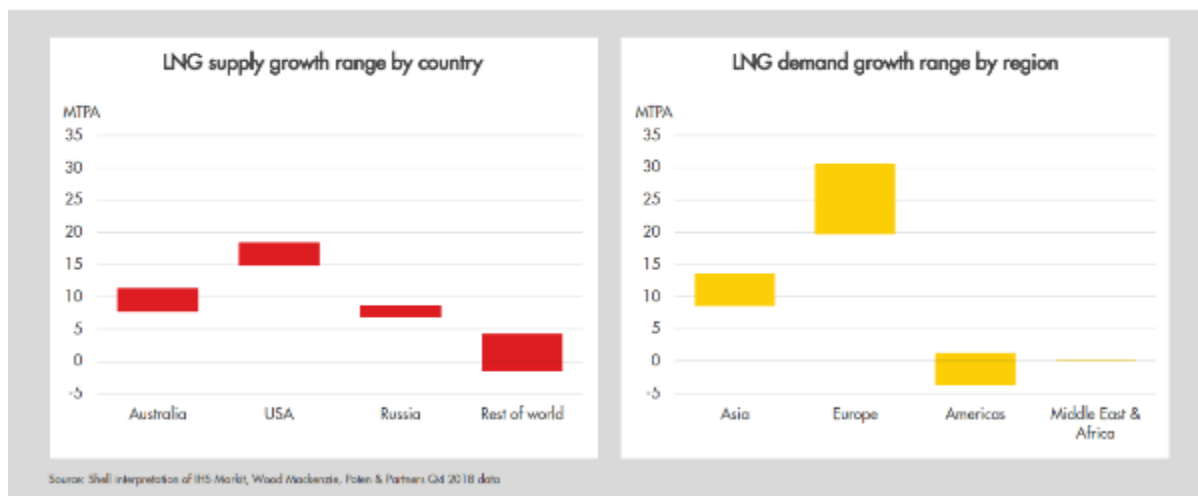


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New supply expected to be absorbed by Asia as well as Europe in 2019

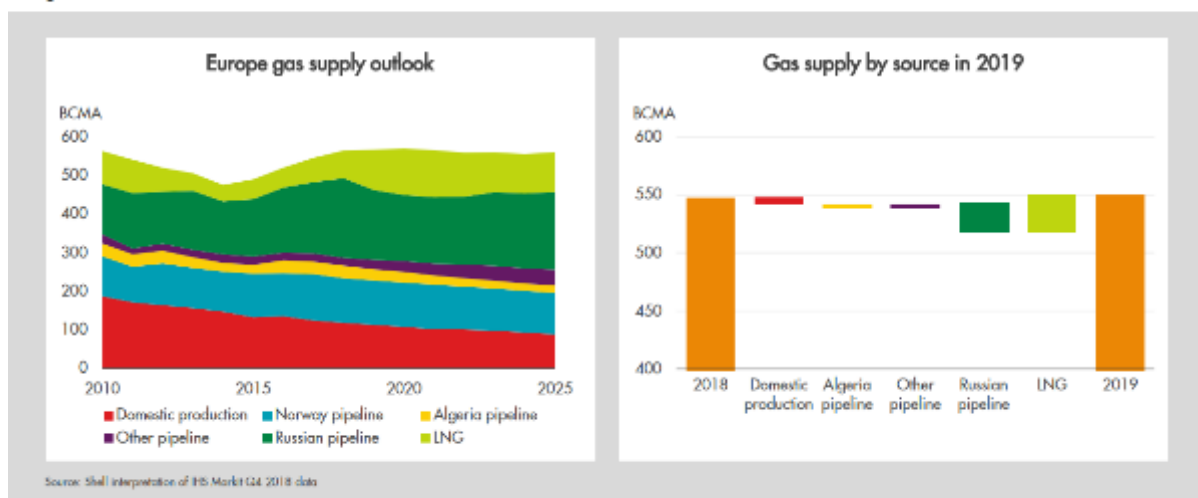


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Europe needs more imports to offset declining domestic gas production

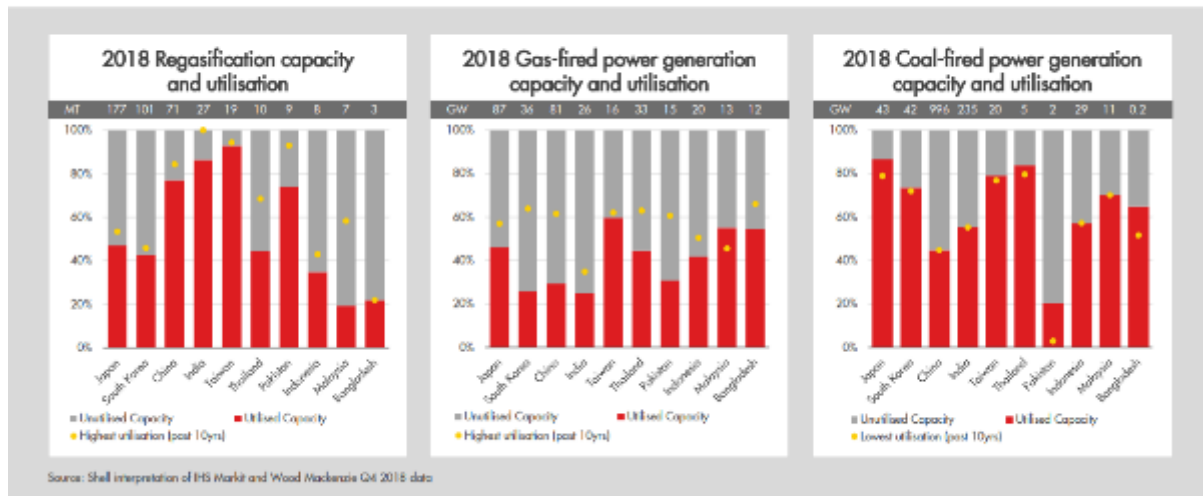


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Asia has significant potential to take more LNG volumes

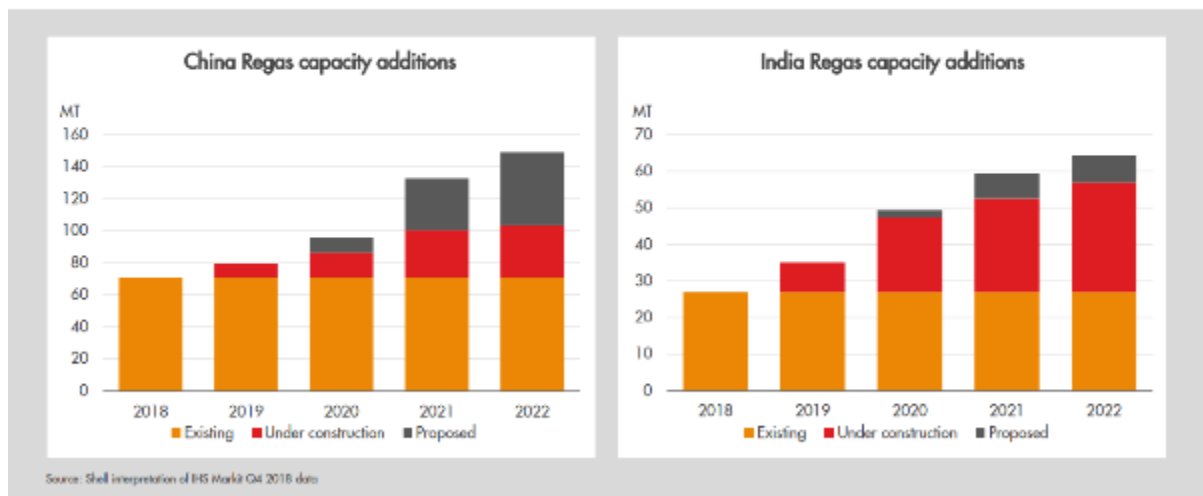


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◆ SHELL LNG OUTLOOK 2019

China and India can double import infrastructure in 5 years

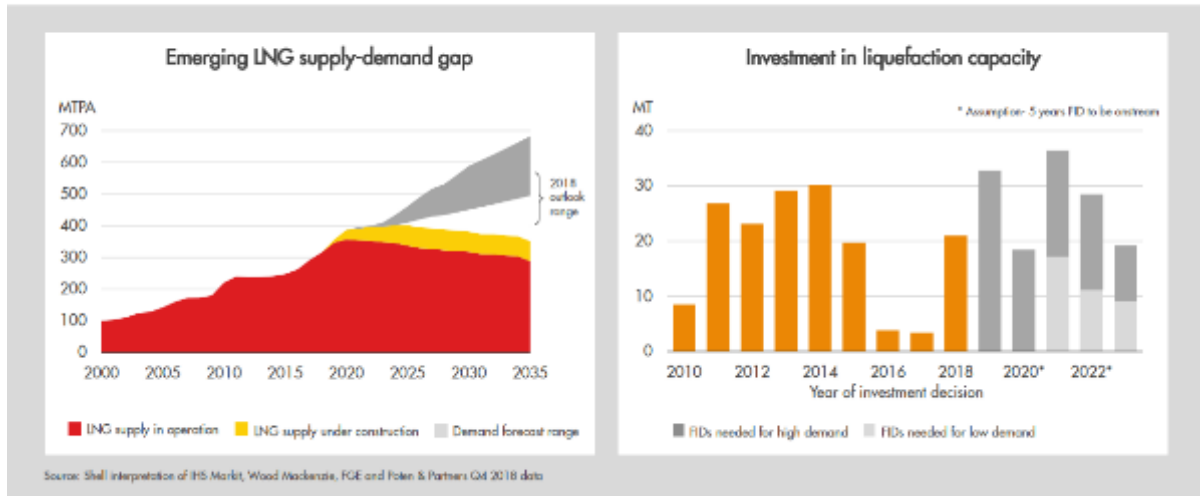


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SHELL LNG OUTLOOK 2019

Supply investment still needed to meet continued LNG demand growth



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Growing recognition of the role of gas and LNG as the world tackles poor air quality and climate change

- Gas to supply the largest share of energy demand growth, supplying over 40% of additional demand by 2035
- Coal-to-gas switching led to 78% improvement in Beijing winter air quality over the last five years

Asian LNG imports exceed expectations again in 2018 absorbing continued supply growth

- China became the world's largest gas importer, with LNG imports doubling over two years
- JKM futures trading volume increased ten-fold since 2016

Near term supply growth expected to be absorbed by Europe and Asia – continued need for investment in supply to meet long-term demand growth

- 35 MT additional supply expected in 2019
- 2018 saw final investment decisions on 21 MT of new capacity compared to a total of 7 MT in the last two years combined

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The International Energy Agency (IEA) released a report on Global CO₂ Emissions in 2019 during the month. The report notes:

Global energy-related CO₂ emissions flattened in 2019 at around 33 gigatonnes (Gt), following two years of increases. This resulted mainly from a sharp decline in CO₂ emissions from the power sector in advanced economies, thanks to the expanding role of renewable sources (mainly wind and solar PV), fuel switching from coal to natural gas, and higher nuclear power output.

Figure 9: World Energy-Related CO₂ Emissions 1990 - 2019 (source IEA)

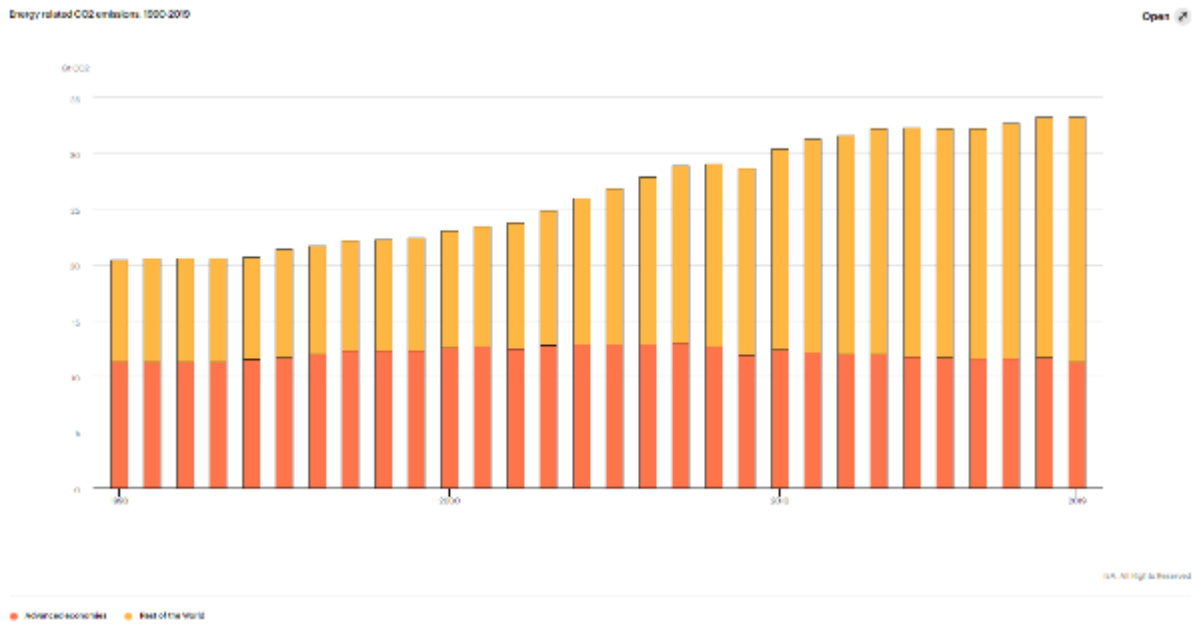
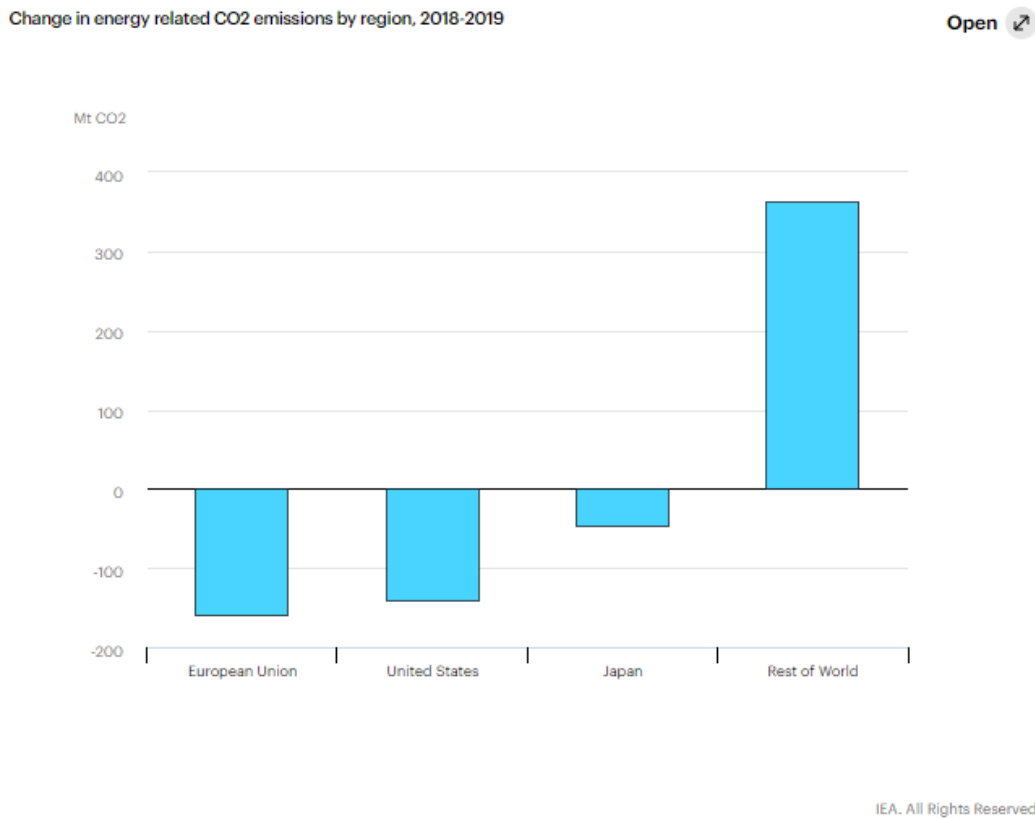


Figure 10 shows change in energy-related CO₂ emissions by region.

Figure 10: Change in Energy-Related CO₂ Emissions by Region 2018 - 2019 (source IEA)



From the report the carbon benefits of natural gas over coal are clear:

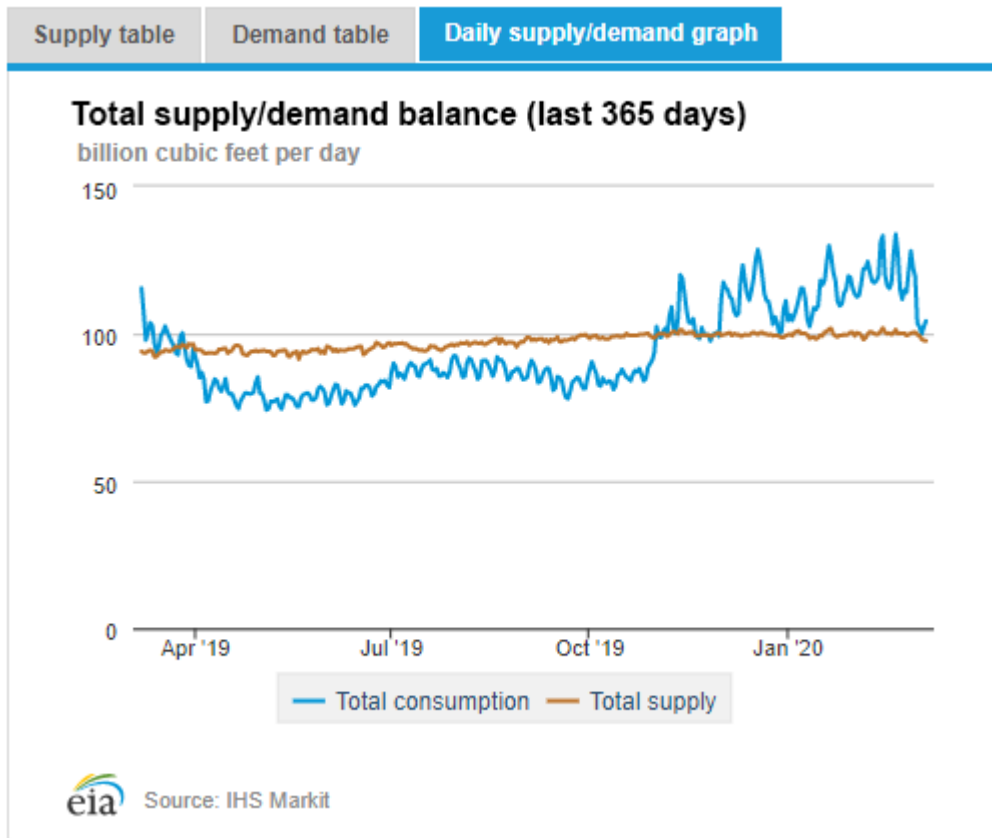
The **United States** saw the largest decline in energy-related CO₂ emissions in 2019 on a country basis – a fall of 140 Mt, or 2.9%, to 4.8 Gt. US emissions are now down almost 1 Gt from their peak in the year 2000, the largest absolute decline by any country over that period. A 15% reduction in the use of coal for power generation underpinned the decline in overall US emissions in 2019. Coal-fired power plants faced even stronger competition from natural gas-fired generation, with benchmark gas prices an average of 45% lower than 2018 levels. As a result, gas increased its share in electricity generation to a record high of 37%. Overall electricity demand declined because demand for air-conditioning and heating was lower as a result of milder summer and winter weather.

Gas Market

In early Feb CNOOC, the operator of nearly 50% of the terminals in China that receive LNG, called force majeure on some LNG contracts for February and March deliveries. The US has only supplied minimal LNG volumes to China since the imposition of the 25% tariff on imports of US LNG to China so the impact on US gas markets was small but this does highlight the demand reduction that has been induced by coronavirus and a warm winter across the northern hemisphere. On 9 March Asia’s price benchmark, JKM futures for April 2020 were \$3.115/mcf (with December 2020 back up to \$5.10/mcf).

The US is still withdrawing gas from storage but by May net injections are expected.

Figure 13: Natural Gas Supply and Demand (source IEA)



The CEO of Cabot Oil and Gas, a large Appalachian gas producer, has announced a reduction in capex for 2020 of 27% from 2019 to \$575m. Simons Energy (a subsidiary of the boutique investment bank Piper Sandler) has calculated that Appalachian public producers on average require Henry Hub price of \$2.60/mcf to hold production flat while living within cash flow on a corporate level. And this assumes \$55/bbl oil. With prices at current levels there will be further reductions in drilling and completion activity.

From the Simons Energy report:

- **Laying the Foundation for a Late '20/Early '21 Recovery:** We see the potential for challenging months ahead (particularly in the shoulder season). However, we expect less robust injections over the summer (+1.9 Tcf in 2020 vs. +2.6 Tcf in 2019) and believe the combination of stalling production coupled with demand growth could lay the foundation for a late '20 or early '21 recovery for natural gas prices. Over the medium term, assuming associated gas production grows by 2 bcf/d per annum, less economic gas plays continue their descent, non-trade related demand grows (albeit at a decelerated pace), and exports continue their ascent, we believe Appalachia/Haynesville need to grow in the low-to-mid single digits to maintain market equilibrium. Given our view that Appalachia currently needs ~\$2.60/HH to hold production flat within cash flow and the Haynesville requires \$2.70/HH-\$2.80/HH to generate 25%-30% IRRs prior to corporate charges, we believe the medium term strip is unsustainable at ~\$2.40/MMBtu.

From the EIA Short Term Energy Outlook published on 11 Feb:

- In January, the Henry Hub natural gas spot price averaged \$2.02 per million British thermal units (MMBtu), as warm weather contributed to below-average inventory withdrawals and put downward pressure on natural gas prices. As of February 6, the Henry Hub spot price had fallen to \$1.86/MMBtu, and EIA expects prices will remain below \$2.00/MMBtu in February and March. EIA forecasts that prices will rise in the second quarter of 2020, as U.S. natural gas production declines and natural gas use for power generation increases the demand for gas. EIA expects prices to average \$2.36/MMBtu in the third quarter of 2020. EIA forecasts that Henry Hub natural gas spot prices will average \$2.21/MMBtu in 2020. EIA expects that natural gas prices will then increase in 2021, reaching an annual average of \$2.53/MMBtu.

Oil Market

With the collapse in oil prices it is worth revisiting two charts that were in the January report produced by the Dallas Fed. The Dallas Fed has surveyed producers to determine: (i) oil price required to profitably drill a new well; and (ii) WTI level required to cover operating costs for existing wells. These data show that new supply will fall away as oil approaches \$50/bbl and current producing wells will start to be shut-in, accelerating the supply reduction, below \$40/bbl. The supply response over coming months, both in US onshore and rest of the world, will be very interesting.

Figure 14: Breakeven Prices for New Wells (source Dallas Fed)

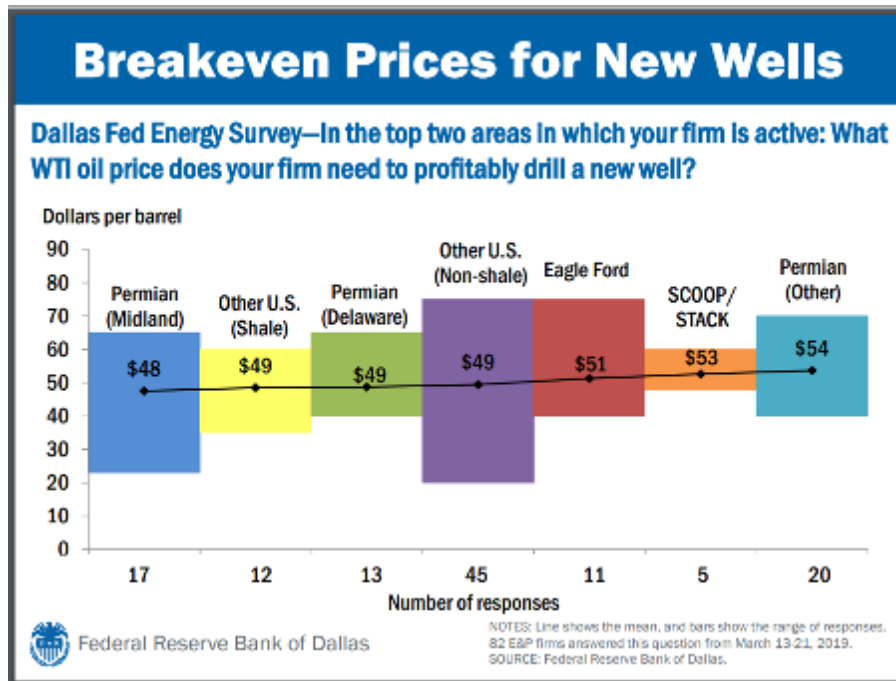
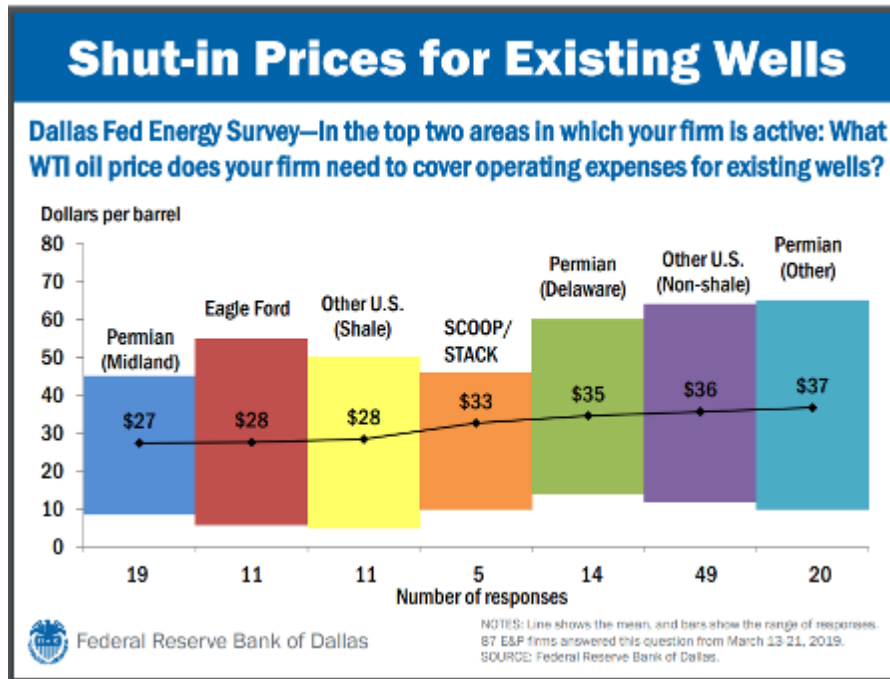
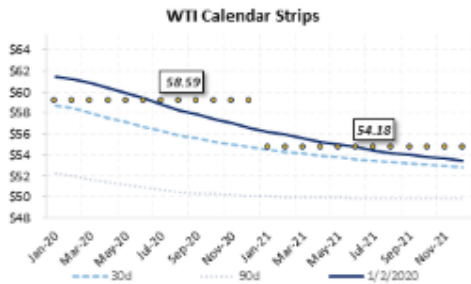


Figure 15: Shut-in Prices for Existing Wells (source Dallas Fed)



Gas and Oil Prices 3 February 2020



Swap Pricing

	Cal 20	Cal 21	Cal 22	Cal 23
NYMEX WTI Crude	\$ 58.59	\$ 54.18	\$ 52.07	\$ 51.39
ICE Brent Crude	\$ 63.07	\$ 59.02	\$ 57.23	\$ 56.80
Louisiana Light Sweet	\$ 61.86	\$ 57.12	\$ 54.95	\$ 54.25
TM Midland Differential	\$ 0.90	\$ 1.10	\$ 1.10	
NYMEX Natural Gas	\$ 2.29	\$ 2.43	\$ 2.42	\$ 2.46

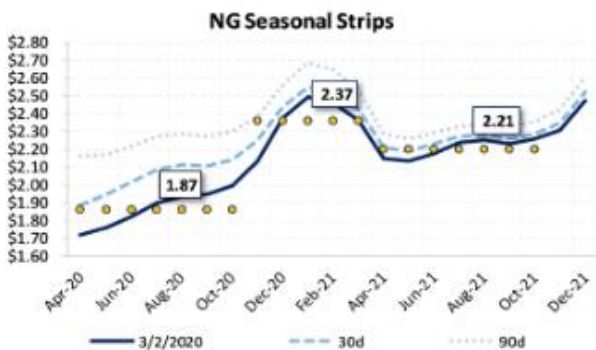
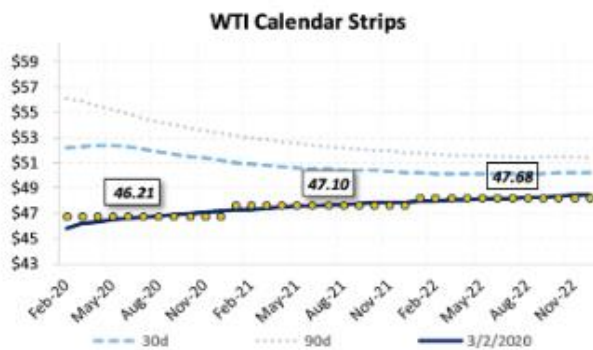
Source: Bloomberg LP
 Note: Midland diff changed to TM computation Oct 1. All prices indicative only.

Natural Gas Basis

Location	Spot	Q1 '20	Summer '20	Winter '20/'21
Henry Hub Fixed	\$2.09	\$2.16	\$2.27	\$2.60
TETCO M3	\$ (0.14)	\$ 0.75	\$ (0.33)	\$ 1.15
MichCon	\$ (0.14)	\$ (0.14)	\$ (0.21)	\$ (0.14)
CIG	\$ (0.17)	\$ (0.40)	\$ (0.59)	\$ (0.38)
TETCO M2	\$ (0.24)	\$ (0.36)	\$ (0.49)	\$ (0.40)
Dominion S	\$ (0.40)	\$ (0.37)	\$ (0.46)	\$ (0.40)
NGPL-Midcon	\$ (0.69)	\$ (0.76)	\$ (0.56)	\$ (0.37)
Waha	\$ (0.81)	\$ (1.50)	\$ (1.61)	\$ (1.21)

All prices as of close yesterday

Gas and Oil Prices 2 March 2020



Swap Pricing

	Bal 20	Cal 21	Cal 22	Cal 23
NYMEX WTI Crude	\$ 46.21	\$ 47.10	\$ 47.68	\$ 48.25
ICE Brent Crude	\$ 50.63	\$ 51.77	\$ 52.55	\$ 53.27
Light Louisiana Sweet	\$ 49.18	\$ 49.90	\$ 50.37	\$ 50.98
TM Midland Differential	\$ 1.36	\$ 1.28	\$ 1.25	
NYMEX Natural Gas	\$ 1.96	\$ 2.30	\$ 2.39	\$ 2.44

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

Natural Gas Basis

Location	Spot	Summer '20	Winter '20/'21	Summer '21
Henry Hub Fixed	\$1.79	\$1.85	\$2.34	\$2.19
MichCon	\$ (0.14)	\$ (0.23)	\$ (0.13)	\$ (0.19)
TETCO M3	\$ (0.24)	\$ (0.33)	\$ 1.04	\$ (0.32)
CIG	\$ (0.34)	\$ (0.55)	\$ (0.36)	\$ (0.62)
Dominion S	\$ (0.34)	\$ (0.44)	\$ (0.37)	\$ (0.43)
TETCO M2	\$ (0.35)	\$ (0.46)	\$ (0.36)	\$ (0.45)
NGPL-Midcon	\$ (0.42)	\$ (0.47)	\$ (0.38)	\$ (0.48)
Waha	\$ (1.59)	\$ (1.67)	\$ (1.54)	\$ (0.98)

All prices as of close yesterday

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