

## Oil and Natural Gas Prices-Are They Sustainable at These Levels?

### Executive Summary

**Issue:** *There are three primary drivers that must be considered when looking at oil and gas prices. First, they are commodities, and move with the complex economics of global supply and demand. Second, they are very volatile. And third, they can be significantly influenced by global, geopolitical factors.*

**Challenge:** *The challenge for anyone doing transaction, valuation, bankruptcy, and litigation work with companies whose cash flows are driven by oil and gas prices is that the analysis can be very hard to do. Often short-cuts are taken, such as using flat price curves or minimal sensitivity analysis. These simplifications can be disastrous.*

**Solution:** *The solution involves having a deep understanding of commodity market behavior and pricing as a prerequisite to engaging in any professional services exercise with energy companies. Analytical work in this industry needs to be done by those firms that have this experience and technical ability, with an eye toward rational, not aspirational, commodity pricing as the basis of work product.*

I can remember it like it was just yesterday. We were doing modeling and valuation work for an independent, upstream E&P (exploration and production) company. The valuation element was for equity compensation, for Accounting Standards Codification “ASC” 718 and Internal Revenue Code “IRC” 409(a) purposes. The broader modeling aspect was treasury focused, to stress test the debt capacity of the business. The front month West Texas Intermediate (“WTI”) contract was trading at about \$105 per barrel, and we wanted to risk our cash flow model. The Client said something to the effect “OK, go ahead and run an \$85 oil case if it makes you happy.” We all know how the story ends, a couple of years later. WTI closed at \$26.19 on February 11, 2016.

Natural Gas is no stranger to rapid price movements either, as anyone working in this part of the country knows. Whenever there is a hurricane in the Gulf of Mexico, prices spike rapidly over assumptions that production will be cut because of the storm, lowering supply.

But we might be asking the wrong question with “Oil and Natural Gas Prices-Are They Sustainable at These Levels?” The answer is “yes,” as this short article will discuss. But the real question should be “which price level assumptions for oil and gas should be used for valuation, lending, transaction, and capital investing decisions?” We are probably right at those very levels now. Hope is not a strategy, and it is essential for all of the various players in the oil and gas business to avoid the notion that we can expect prices to “go back up” or “be where we need them to be” or “return to normal.” Oil and gas prices are trading where they should be trading, given market dynamics, so plan accordingly.

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## Supply and Demand

Crude oil is supplied and consumed globally. The U.S. Energy Information Administration (“EIA”) is an excellent source for data on a wide variety of economic information and analysis, including supply and demand, across the energy complex. It is part of the U.S. Department of Energy (“DOE”). For example, the most recent EIA newsletter highlights that *“annual U.S. crude oil production will average 11.6 million b/d in 2020, down 0.6 million b/d from 2019 as result of a drop in drilling activity and production curtailments related to low oil prices.”*<sup>1</sup> This is a textbook supply/demand sentence. Lower prices caused some producers to cut back, and this in turn lowered supply. There is broad consensus that the COVID pandemic has pressed global oil demand downwards, and there is plenty of data that supports this thesis. The EIA analysis also includes references to COVID.

The supply side is an important factor as well. On March 9 of this year, oil prices dropped when Saudi Arabia boosted its oil production to challenge Russia for its failure to adhere to production quotas. The Organization of the Petroleum Exporting Countries, OPEC, manages crude oil supplies via a quota system. OPEC+ refers to a broader group of producing nations formed about three years ago. Russia is the dominant non-OPEC player in OPEC+. It is not a mystery where crude oil supply comes from, the challenge has to do with how quickly demand will return to levels seen before COVID.

Natural gas was traditionally not supplied and consumed globally. It is typically shipped via pipelines, and this is hard to do (and too expensive) across the world’s oceans. The Liquefied Natural Gas (“LNG”) industry developed to solve this challenge. LNG is natural gas, or methane, usually with some ethane in it, that has been cooled to -260 degrees Fahrenheit. Why? Because at this temperature natural gas can be transported quite safely, because it does not have to be pressurized at this temperature. It is not flammable or explosive in this state. LNG can be moved in large ships to where it is needed, and then re-gasified to be burned as fuel.

LNG can solve a fundamental market supply-demand problem: there is a lot of gas in places where it is not necessarily needed, and not enough gas in places that could use it for power generation instead of coal. According to the EIA *“the Henry Hub natural gas spot price averaged \$1.63 per million British thermal units (MMBtu) in June.”*<sup>2</sup>, **due to low demand**. The so-called shale revolution here in the U.S. opened vast reserves of natural gas, and natural gas liquids, that exceed the demand needs here in the U.S. Potential demand from abroad is real, if and only if the US can ensure that it will produce the gas and get it to Asia and to Europe.

Petroleum economics is a big, complex topic, and beyond the scope of this short article. The key takeaways on the supply side are that the OPEC+ group of powers will continue to try to manage oil prices by controlling supply, offset to some degree by the rapid growth of production potential in the U.S. Look at it as a rough, imprecise cap and floor structure. If OPEC+ reduces supply, to drive up prices, more U.S. production will enter the market, thereby placing downward pressure on prices. It’s not exact or clean, given that different grades of crude oil and refinery capacity play a role in the dynamic as well, but the broad theme is correct and should keep us in the trading range we are in now for the near-term.

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<sup>1</sup> US Energy Information Administration, *Short-Term Energy Outlook*, July 2020.

<sup>2</sup> *Ibid.*

As for natural gas, there is no shortage on the supply side. This question remains: will gas-fired power generation in both the developing and developed world replace coal rapidly, such that demand pushes prices up? Until Washington, Oregon, and California become more concerned about the climate, and allow the U.S. to send LNG directly to Asia through the West Coast, where it will replace and eliminate coal power plants, the outlook is flat for now.

## Volatility

Commodities, including oil and gas, are far more volatile than other asset classes like fixed-income and equities. Using data from the EIA, I have illustrated below just how volatile they can be. The EIA data for WTI Spot, at Cushing Oklahoma, goes back to January 15, 1986. From then until now, the average annual price volatility has been 44%, and this does not include the aberration in prices that happened this year when WTI closed below zero. That episode highlighted the impact that financial trading can have on a physical market. Note that the mean price during this period is \$44, and the median is about \$31. Given that oil prices are a large driver of inflation, especially Producer Price Inflation, it is unwise to inflate oil or gas prices. This is a form of double-counting and is also true of most other commodities.

This EIA data supports the contention that prices are sustainable where they are now. Why do market participants talk about prices “recovering?” Recovering to what price level? There is a good deal of evidence that suggests commodities are mean reverting, at least to some degree. If this is the case, then perhaps oil is reverting to its mean right now.

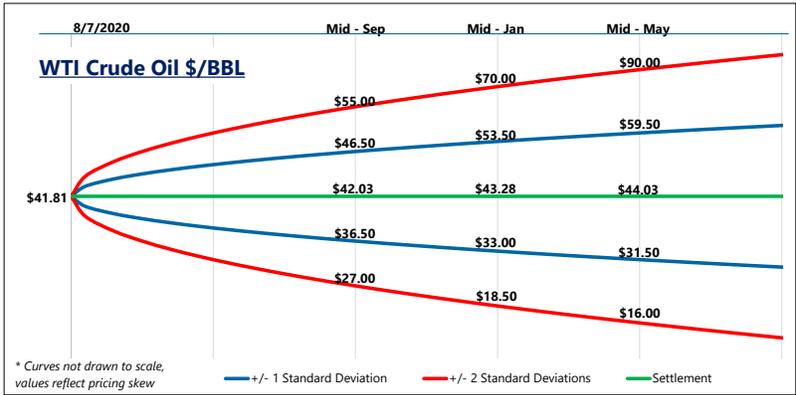
Cushing, OK WTI Spot Price FOB (Dollars per Barrel) From 1/15/1986	
Annual Volatility	44.5%
Mean	\$44.05
Median	\$31.27

Natural gas volatility has been even worse, although less so lately. From January 20, 1997, to now, the Henry Hub contract has experienced very high annual volatility. At this time, we are well below both the mean and median prices, and this is a direct result of the supply side. Natural gas is being flared now in the U.S., which means that it is being burned at the well head rather than gathered and transported to markets. The demand side of the supply-demand dynamic is insufficient, so gas is being wasted.

Henry Hub Natural Gas Spot Price (Dollars per Million Btu) From 1/20/97	
Annual Volatility	73.9%
Mean	\$4.19
Median	\$3.54

Given this kind of severe volatility, for both oil and gas prices, it is inherently dangerous for market participants and their advisors to do valuation, lending, and deal work based on potential price upside scenarios. The supply-demand balance in place now, coupled with price levels at or below long-term averages, supports the notion that current price levels are sustainable. These implied

prices are based on lognormal analysis, given that oil prices do not consistently behave lognormally, some deviation can be expected. However, think of it this way, it is a much longer distance to travel from current prices up to \$90, than it is back down to \$16!



### Geopolitics

Oil prices, far more so than gas prices, have been impacted by geopolitics for many years, as oil can be used as an economic weapon. For example, in 1940 and in 1941, the U.S. took several actions that ultimately cut off Japan from the vast majority of its oil supply, to punish it for aggression in China and Southeast Asia. In October of 1973, OPEC embargoed oil shipments to the U.S., as a direct result of President Nixon’s support for the State of Israel during the “Yom Kippur” or “October War.” However, diversity of supply can mitigate oil being used as an economic weapon. Earlier this year, when Iran fired missiles at American forces in Iraq, oil prices jumped by about 4%. But that is not the point of the story. The fact that they only jumped 4% points to the impact that U.S. oil production has had in the market. Price spikes in the past, due to heightened tensions in the Middle East and Persian Gulf, were always much higher. Oil and gas prices are sustainable at current levels because there is more diversity of supply than there was in the past.

### Conclusion

There is a standoff to some degree right now, within the supply and demand structure of oil and gas prices. WTI is trading right above \$40 per barrel, and natural gas is below \$2.00 per MMBtu. These price levels are sustainable because the supply-demand balance is capped and floored between OPEC+ and the vast potential of U.S. reserves and production. Volatility continues to be very real, and high, but oil and gas prices, like most commodities, usually display some elements of mean reversion, and we are at or below long term mean prices. And while geopolitical shocks still can and will move oil prices, supply diversity has reduced this traditional impact measurably. The trading range we are in now for oil and gas prices is sustainable and can be expected to remain consistent through the rest of the year.

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