



GELBER & ASSOCIATES

Natural Gas Price Forecast & Industry Review

2019 Hedge Season

April 18, 2019



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INTRODUCTION & DISCLAIMER

Gelber & Associates (G&A) is pleased to provide its Natural Gas Price Forecast for the 2019 Hedge Season. This Forecast predicts the NYMEX front month natural gas contract for delivery at Henry Hub through March 2020, and provides guidance for hedging the 2019-20 and 2020-21 winter seasons. This Forecast is reserved for subscribers, clients, and as a courtesy to prospective clients.

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EXECUTIVE SUMMARY



Prior Forecast Review

Major Drivers of the Prior Forecast (June 2018)

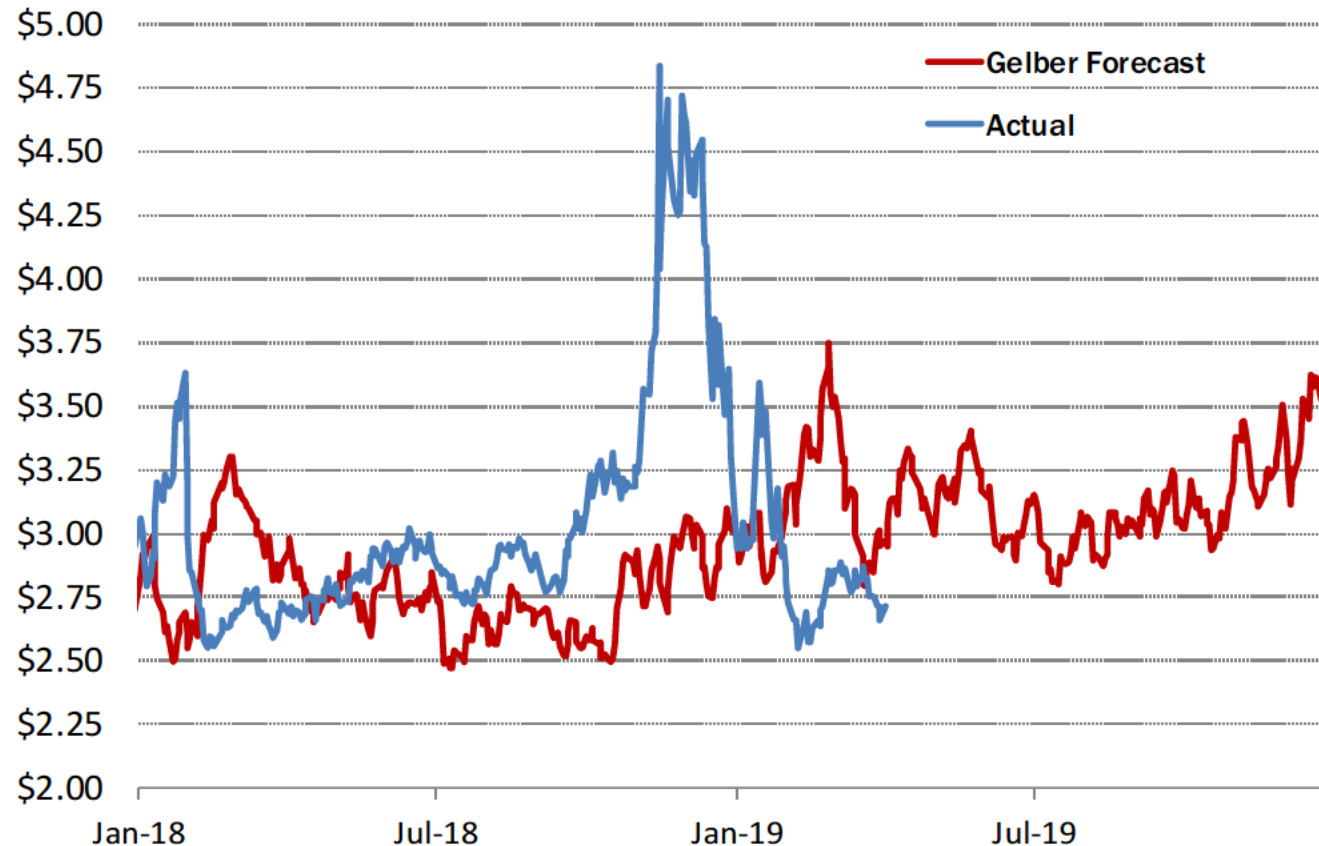
- I. **BELOW-AVERAGE STORAGE:** Storage inventories below the five-year average continued through the 2018 injection season and 2019-20 winter.
- II. **RECORD PRODUCTION:** Production growth saw an even more impressive-than-expected boost in late-2018, just as in 2017.
- III. **STRUCTURAL DEMAND GROWTH:** As expected, LNG, Mexican exports, and industrial demand continued to grow and absorbed record supply before it could reach storage. Permanent shifts in the fuel mix and record power generation further bolster demand growth.
- IV. **FUEL SWITCHING:** Fuel switching helped provide support for prices on the low end as they approached \$2.50.



Looking Back: June 2018 Price Forecast

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Gelber Natural Gas Price Forecast- Summer 2018 Edition



PRIOR FORECAST PERFORMANCE

Gelber's forecast fared well for much of 2018 as the price-floor we identified held strong and the front month kept a relatively weak range below \$3/MMBtu up until September. However, lingering heat into September and early October was followed by a quick turnaround to chilly weather limited injections and kept storage from reaching a comfortable levels prior to the heating season. The subsequent fear-driven rally to almost \$5/MMBtu surpassed forecasts, although it did confirm our prediction of rising prices and renewed volatility in the 2018-19 winter. This past winter's rally dissipated when milder winter arrived in January to pacify low storage fears. Prices have crashed back to a similar low as in 2018 and suggest more price weakness in 2019 than anticipated in our last forecast.



Keys to Outlook for 2019-2020

- Production Growth: Increases from Appalachia will be more gradual in 2019 as producers focus on spending within their means. However, substantial growth from the Permian Basin is expected with coming pipeline completions.
- Demand Growth: L.I.M.P. (LNG, Industrial, Mexico, Power) will all see meaningful growth in 2019 and will soak up much of the additional production.
- Storage: Well below-average start for the 2019 Injection Season will put supply to the test this summer. A significant reduction in the storage deficit would put prices at ease going into next winter.
- Fuel switching: Still a factor. A price decline to \$2.50 and lower will bring increased demand while a price gain to \$3.25 will suppress demand.
- A potential wild card is LNG export rejections this summer if the international markets get flooded.

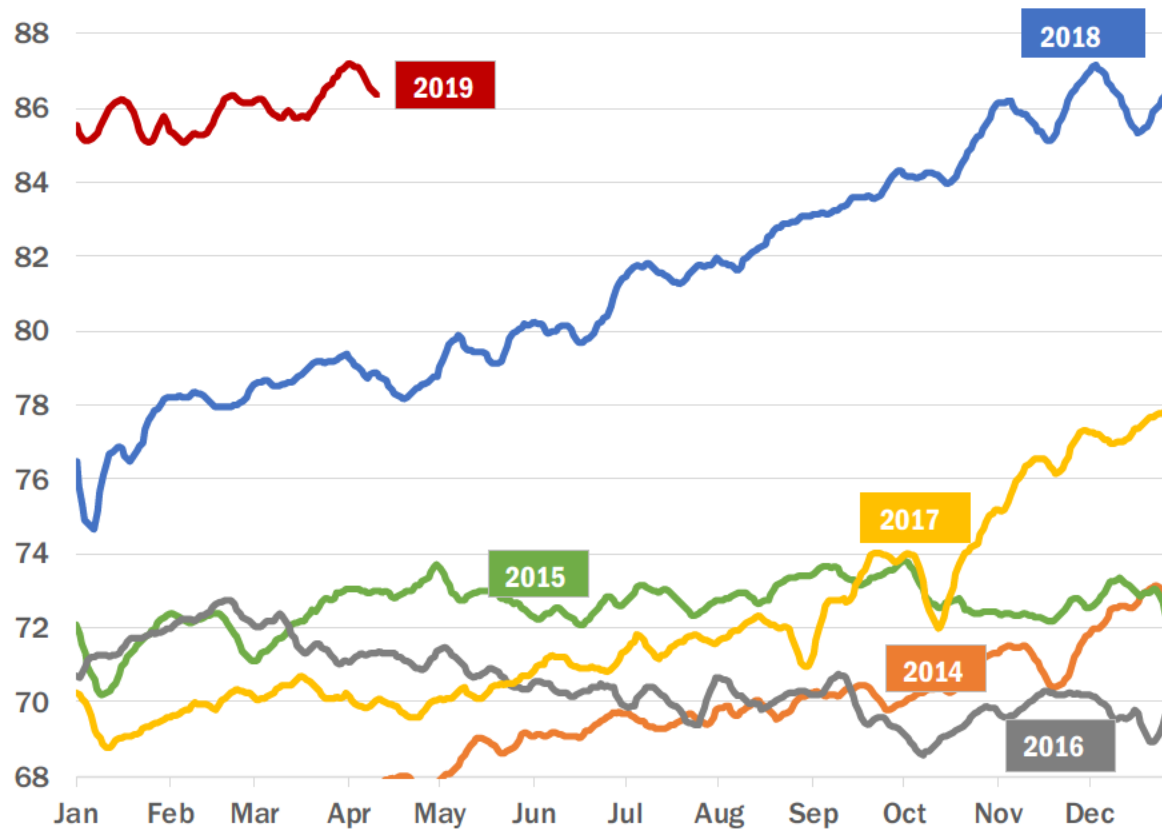


AMPLE SUPPLY

Production growth continues in the coming years,
but at a slower pace

RECORD PRODUCTION

US Dry Gas Production - Bcf/D



PRODUCTION FLAT EARLY IN 2019

Dry gas production has not grown appreciably since November but is still running 8 Bcf/D higher year-over-year. Although production growth is off to a slow start in early-2019, gradual increases can be expected as the year goes on, with more substantial growth expected late in the year (see 2019 production forecast later in this section).



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EXCEEDING THE HYPE - LEBRON AND THE MARCELLUS SHALE



EXCEEDING EXPECTATIONS

Perhaps the greatest compliment you can give to LeBron James, who was anointed "King James" early in his career, is that he somehow managed to live up to the huge expectations given to him.

The same can be said of the Marcellus Shale. The advent of horizontal drilling combined with hydraulic fracturing had the potential to unlock this huge resource. In a 2008, some folks claimed that it "eventually might overshadow the Barnett in productivity". As of today, if the Marcellus were its own country, it would rank third place behind the US and Russia for natural gas production.

The Marcellus Shale is not alone in living up to the hype. The Permian Basin is so far exceeding expectations for its prolific oil and gas production.

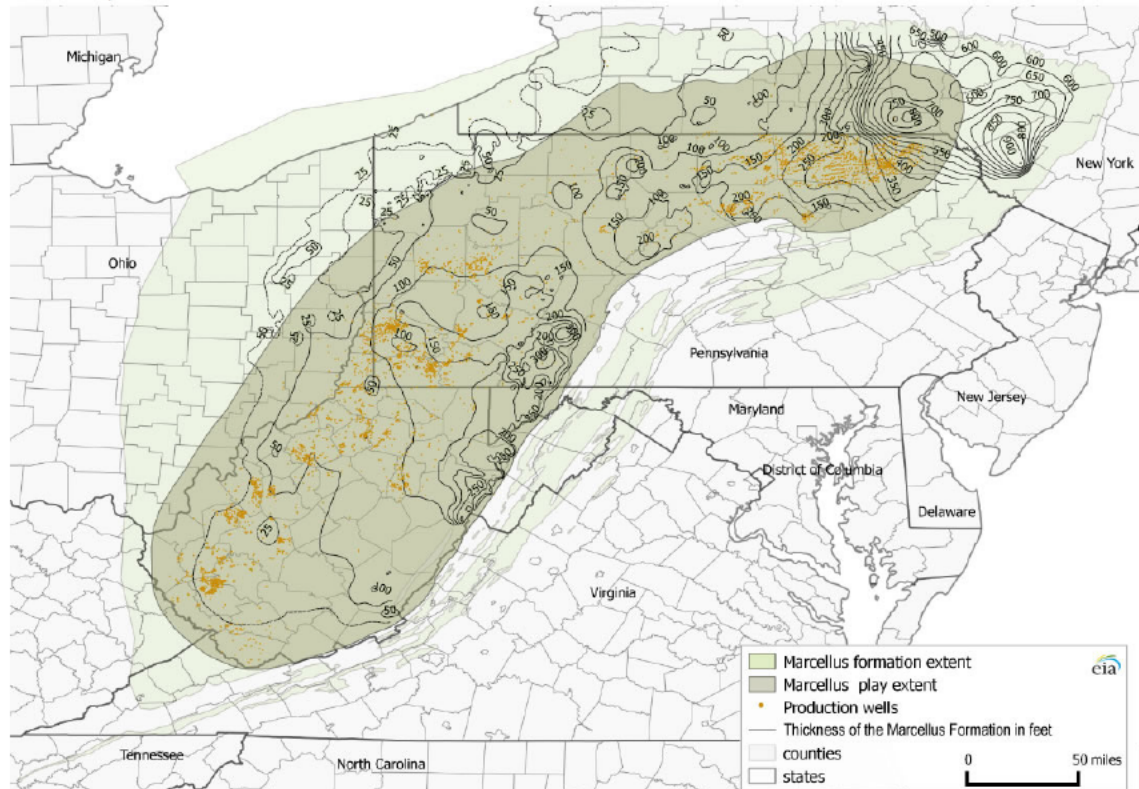
EPIC FAILURES

On the other side of the equation are the well-publicized and over-hyped phenoms that can never quite match their supposed potential. In the sports world, Ryan Leaf (quarterback), JaMarcus Russell (quarterback), Freddy Adu (soccer player) are a few that come to mind. Mentioned below are failures in the natural gas world.

US LNG imports - this was supposed to supply the US with 25% of its gas needs. Today less than 2% is imported and billions of dollars of import capacity remains unused. Other failures include gas hydrates and coal bed methane (not economic at current prices). My personal favorite is the Alaskan Gas Pipeline which has been talked about, studied, and proposed for that past 15 years. In 2007, the Alaskan legislator even passed a law promoting an open season and joint proposals. Now there is a proposal to build a pipeline to supply a new natural gas liquefaction plant to send LNG to China.

MARCELLUS GROWTH SLOWS

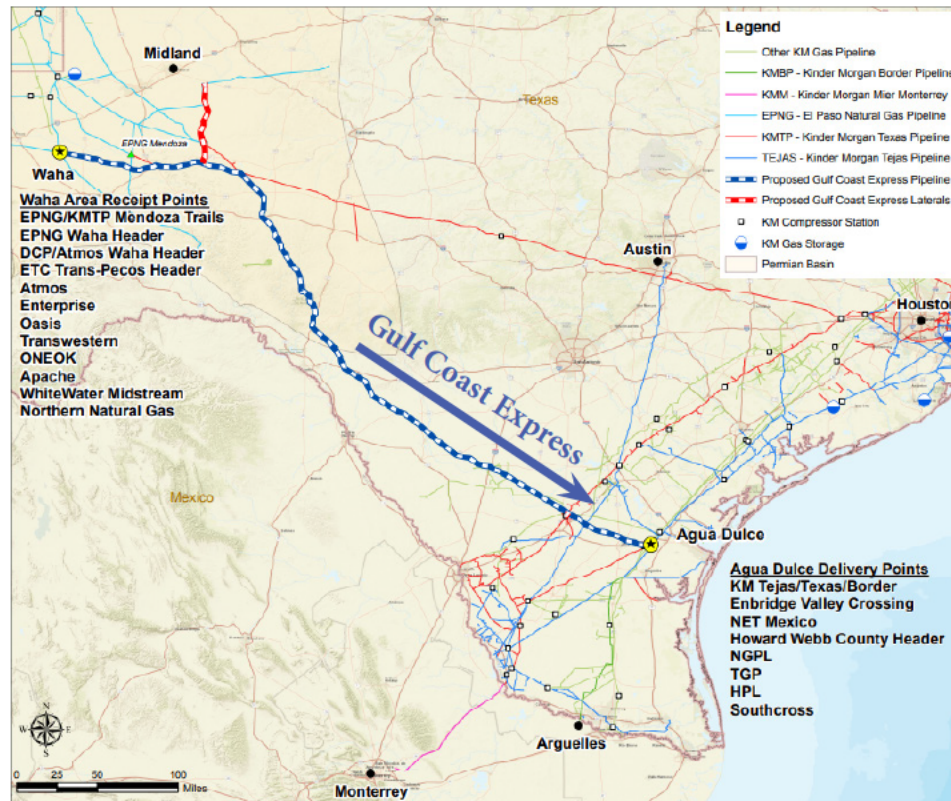
Thickness of the Marcellus Shale
 Values are thicknesses of Marcellus Shale formation in feet.
 Map by the Energy Information Administration



EMPHASIS ON LOWER SPENDING, STEADY GROWTH IN 2019

Last year was the year of the Marcellus, as production companies exceeded ambitious targets and filled new pipeline additions to the brim as they became available. In the coming year, some of the biggest Marcellus producers like EQT and Antero have signaled that they will be scaling back growth plans in the coming year and focusing on generating free cash flows. These companies will still maintain their base production and continue growing through lower costs and improved efficiencies, but overall these plans suggest a shift in this prolific basin.

PERMIAN MIDSTREAM BUILDOUT



GULF COAST EXPRESS RELEASES PERMIAN SUPPLY

Over the past two years, significant Northeast midstream projects like Rover Pipeline, Atlantic Sunrise, and NEXUS Gas Transmission have freed up massive production growth in the Marcellus and Utica shales. In 2019, the focus is now on unlocking vast associated gas production that is currently trapped in the Permian Basin. The most anticipated project this year is Kinder Morgan's 2 Bcf/D Gulf Coast Express Pipeline which will carry gas from Waha hub in West Texas to Agua Dulce hub along the Texas Gulf Coast. This 430-mile project is expected to reach completion in October of 2019 and is already fully-subscribed under long-term transportation agreements. Incremental expansions will improve Permian connectivity and processing capability in the meantime, but the Gulf Coast Express is key to de-bottlenecking this price-independent supply. A second large, long-haul pipeline, Permian Highway, is already scheduled for completion in late 2020 and, along with several other proposed pipelines, would further contribute to the effort to deliver Permian gas to demand markets on the US Gulf Coast.

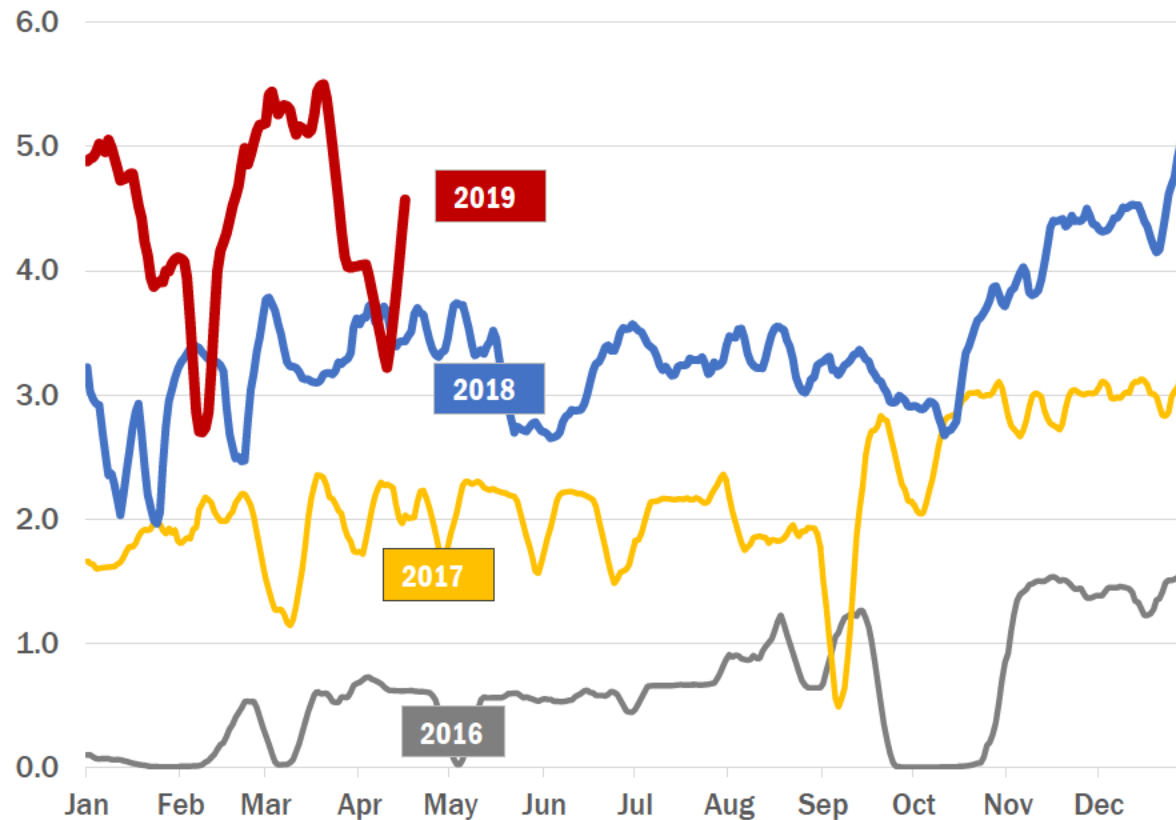


L.I.M.P. DRIVES DEMAND

LNG, Industrial, Mexican Exports, and
Power demand growth

LNG EXPORT DEMAND

Gas Demand for LNG Exports - Bcf/D



ADDITIONAL LNG TERMINALS COMING ONLINE

LNG feedgas demand early this year reached record highs near 5.5 Bcf/D as Cheniere added a new train at its Sabine Pass terminal and brought online its first train and its new facility in Corpus Christi, TX. Shoulder season maintenance temporarily reduced LNG demand in late March/early April, but expect new record highs and impressive growth throughout 2019 and 2020. The next page shows the culmination of LNG projects that will soon be on line.



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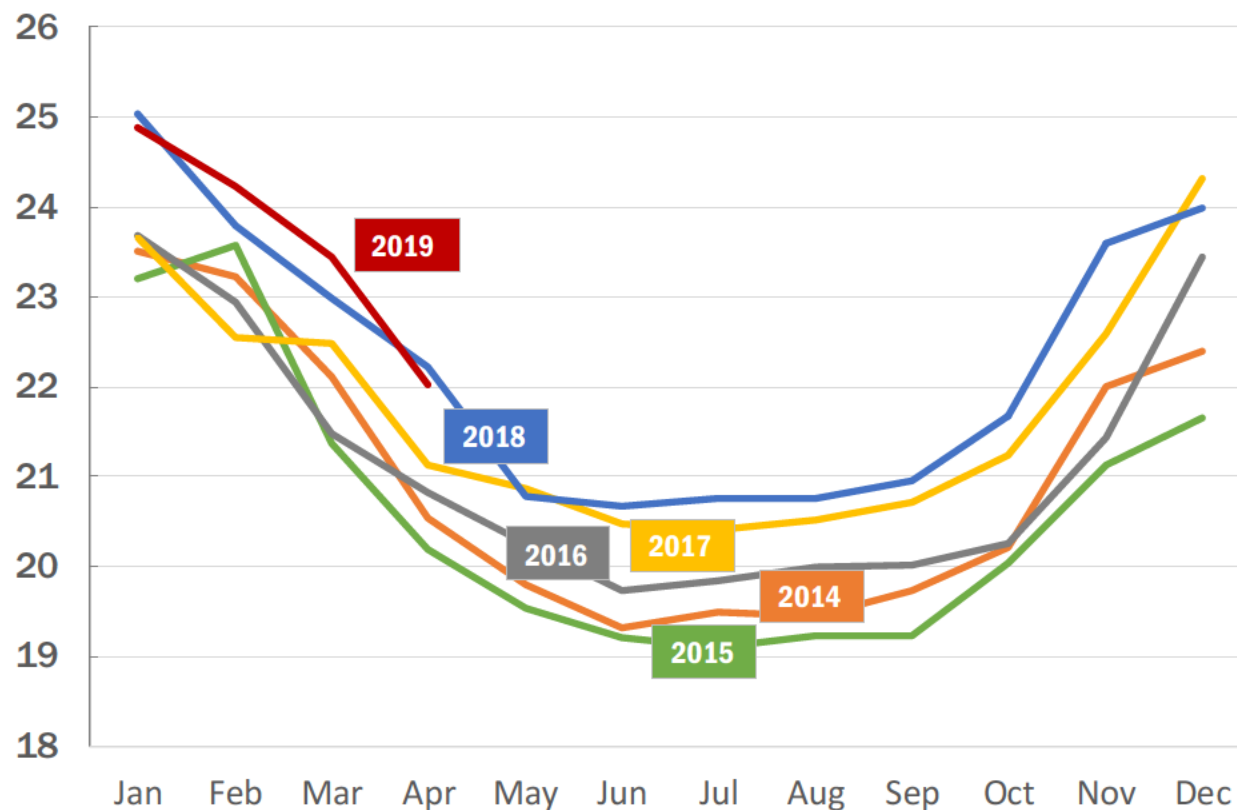
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INDUSTRIAL DEMAND

Industrial Demand (Bcf/D)



THE SEASONAL NATURE OF INDUSTRIAL DEMAND

Low, stable gas prices brought about by the shale revolution have sparked a renaissance in US industrial investment in the Midwest and Gulf Coast regions. The above shows the seasonality of industrial demand as the highest demand months are during the coldest months of the year. Nonetheless, the renaissance of industrial gas consumption has increased demand during winter highs and summer lows.



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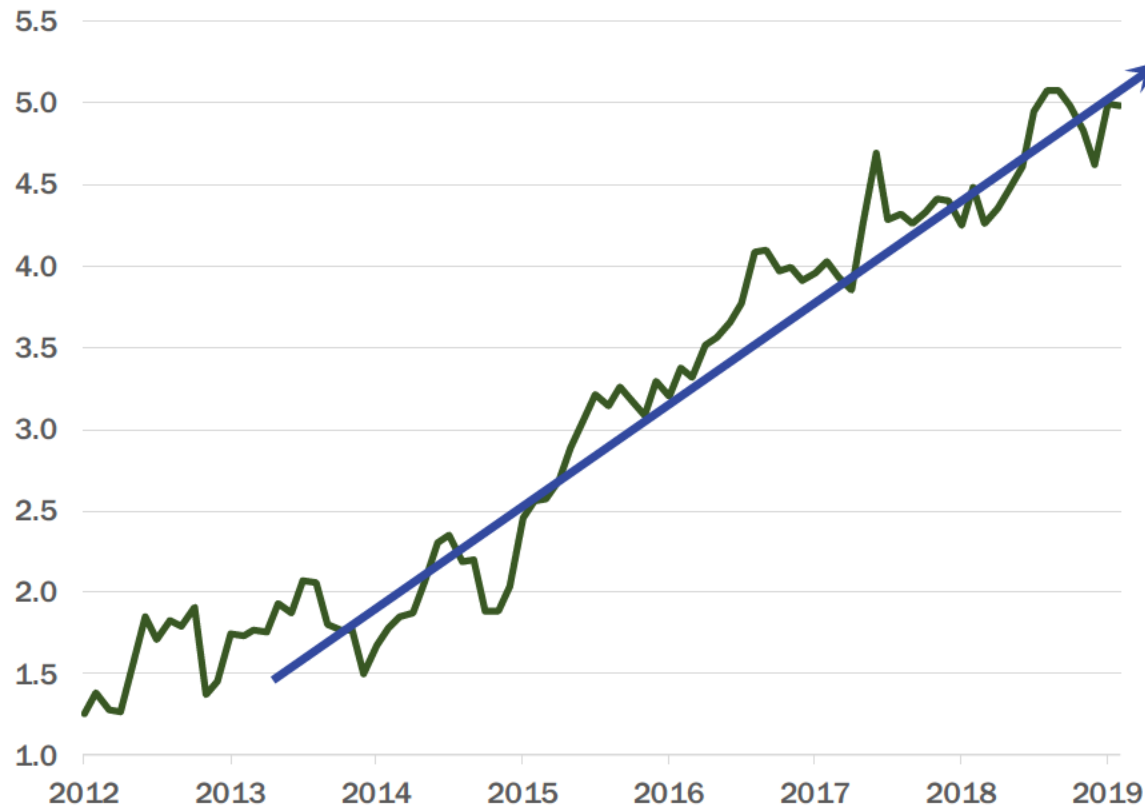
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SHIFTING EXPORTS TO MEXICO

Mexican Export Demand - Bcf/D

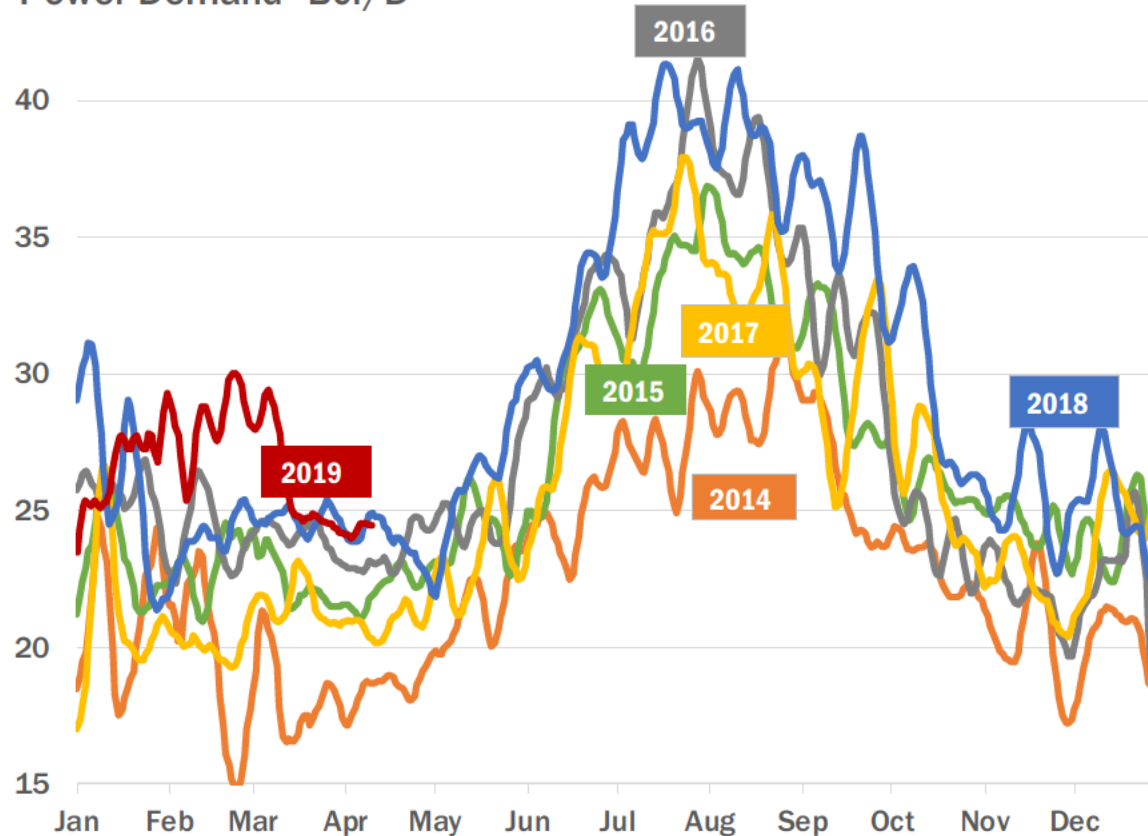


EXPORT GROWTH CONTINUES AT A MEASURED PACE

Natural gas exports to Mexico saw solid growth last year and are expected to grow further in late 2019 and 2020. Infrastructure constraints within Mexico are the limiting factor for this demand source. The Sur de Texas-Tuxpan marine pipeline will add an additional 2.6 Bcf/D of cross-border capacity in the coming months when it connects to the Valley Crossing pipeline in Texas. The size of this project has the potential to increase exports to Mexico and replace imported LNG. Additional pipeline connections within Mexico will also allow it to import additional gas from the Permian basin that will help ease some constraints in that supply region. Despite the tendency for infrastructure projects within Mexico have delays, expect growing demand of US gas for years to come.

POWER DEMAND

Power Demand- Bcf/D



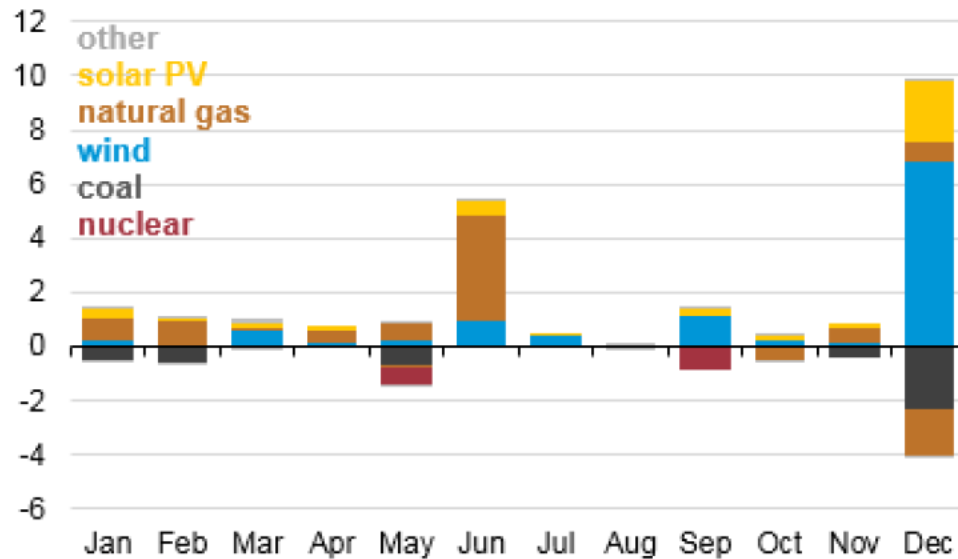
PERMANENT COAL DISPLACEMENT AND TEMPORARY FUEL SWITCHING

Natural gas power generation had a record year in 2018 and is expected to take an even bigger share of the power generation mix in 2019. Natural gas is permanently displacing coal and nuclear capacity as those fuel sources undergo retirements. Nonetheless, the price-dependent component of power demand (fuel switching) still remains a factor.

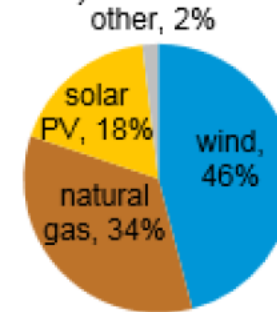


MUCH LESS COAL RETIREMENTS IN 2019

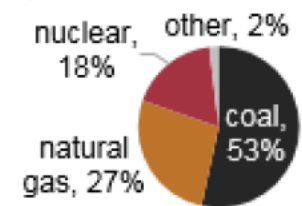
U.S. electric capacity additions and retirements, 2019
gigawatts (GW)



planned additions
(24 GW)



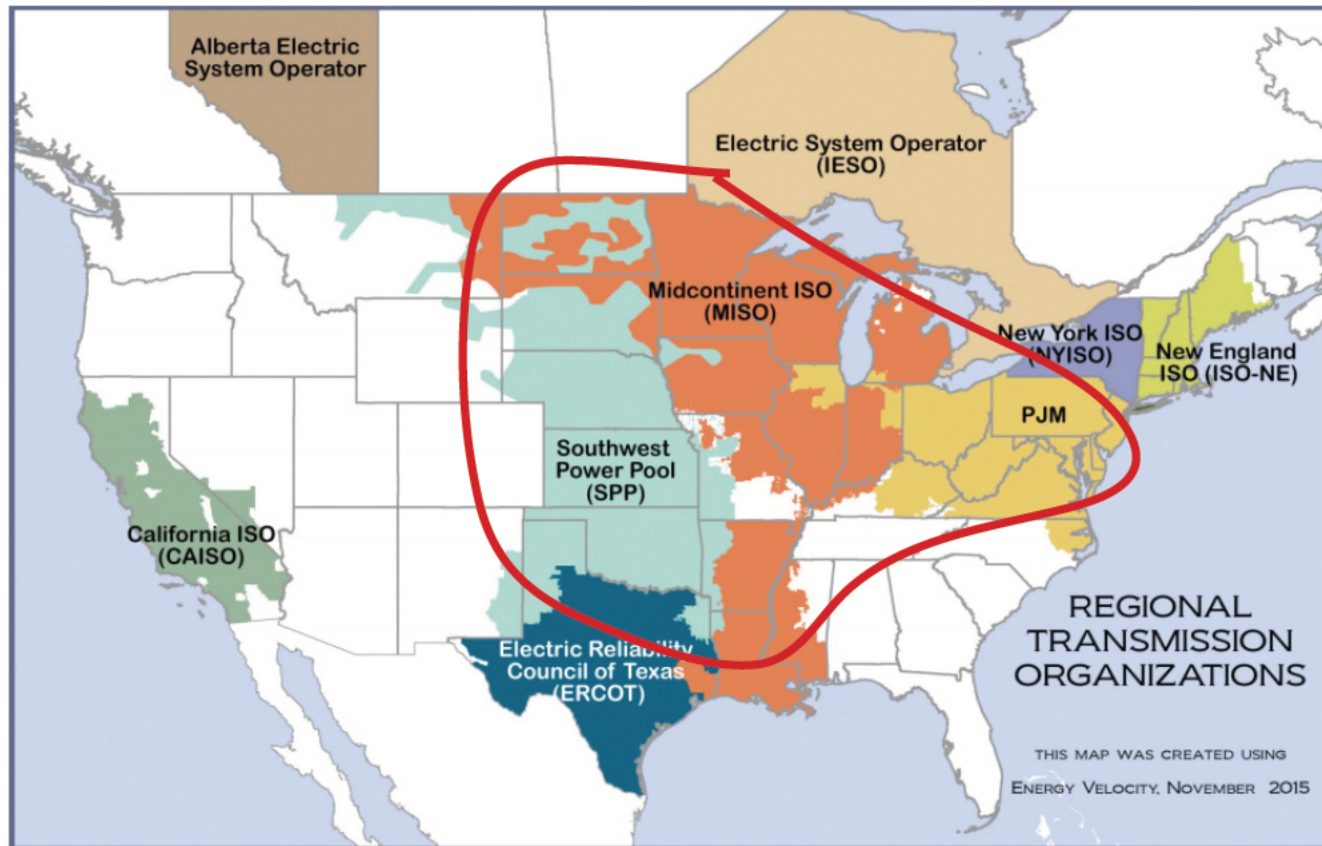
planned retirements
(8 GW)



GAS GENERATION AND RENEWABLES CONTINUE TO TAKE OUT COAL

The story for the last five years remains the same. Coal continues to lose market share battle to renewables and its primary nemesis - natural gas. After a big year for coal retirements, about the 4 GW of coal capacity will be retired in 2019. This is far less than 14 GW of capacity that retired in 2018. Meanwhile another 2.8 GW of natural gas capacity is to be added. With natural gas prices being so cheap, expect most of this capacity to be utilized at the expense of coal.

BREAKING DOWN THE ISO



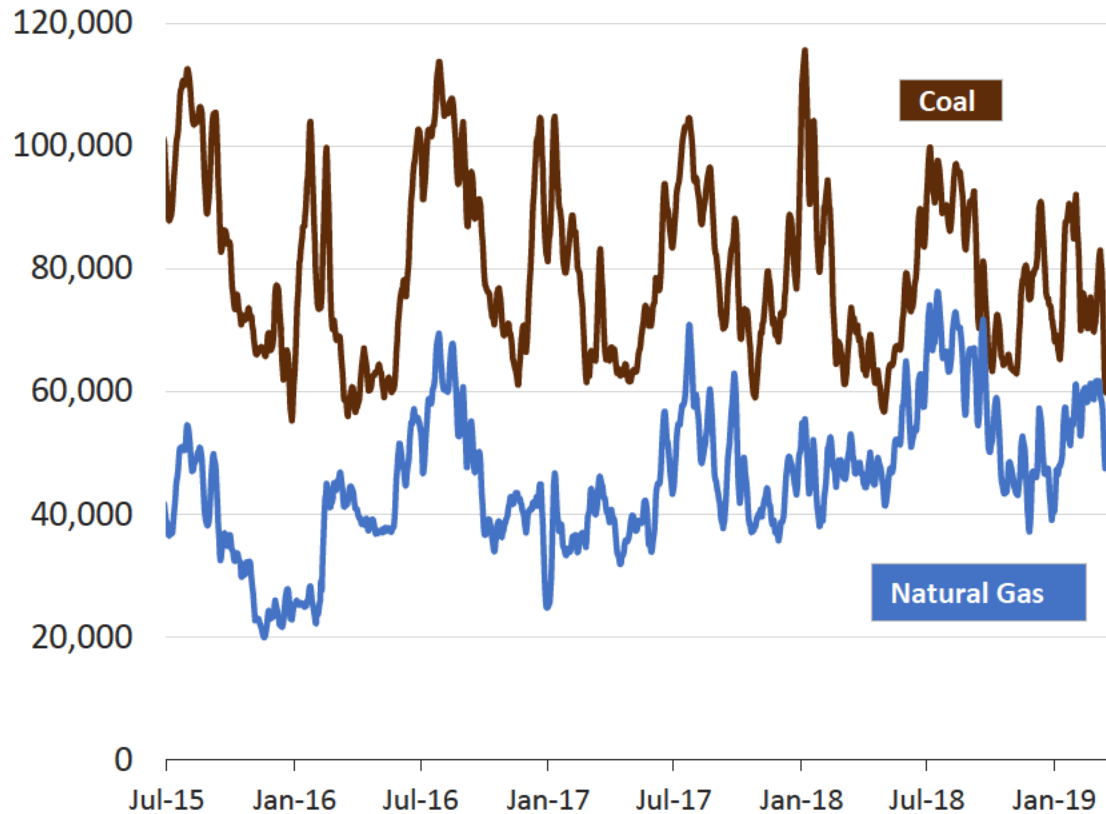
ISO

Shown below is James Harden of the Houston Rockets, a basketball player known for his “iso” or isolation. In this instance, we are analyzing ISO’s or Independent Service Operators. The ISO’s selected include PJM, Midcontinent (MISO), and Southwest Power Pool SPP. These ISO’s have good data available and represent a large swath of the US with natural gas and coal generators who have the ability to switch between the two fuels. The selected ISO’s will be discussed on the coming pages.



NATURAL GAS SURPASSES COAL

PJM, MISO, SPP - MW (Daily Average)



GAS GENERATION TAKES OUT COAL

The above compares the daily average of generation from coal and natural gas from the combined PJM, MISO, and SPP power ISO's. The retirement of coal plants and competition from cheap natural gas is decreasing coal's dominance. Much of the decreased coal generation is from retirements and will never return. This past month power generation from gas for this combined region surpassed generation from coal for the first time. A key question is how much is economic and can return if the price is right?



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BALANCING THE MARKET

Impacts of supply and demand growth on storage and price



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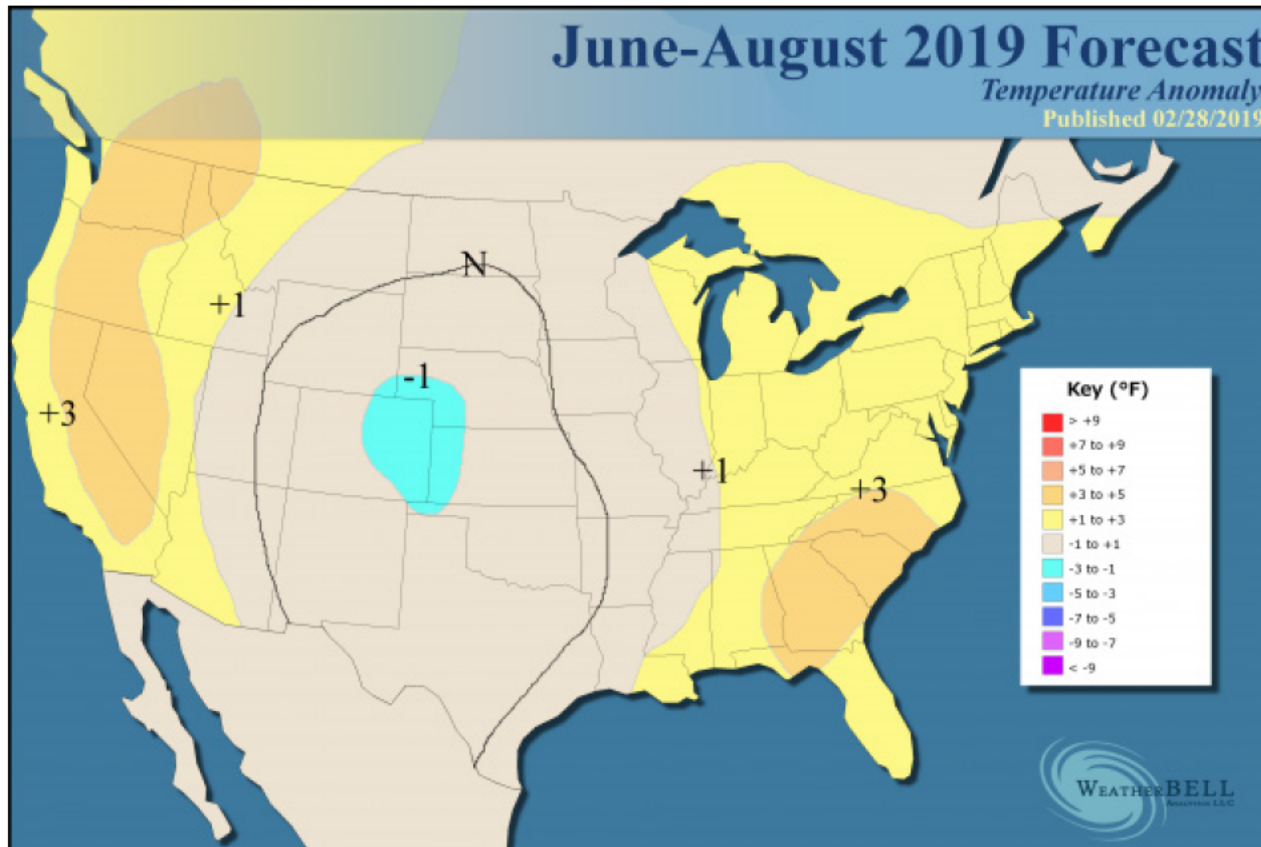




TOPICS OF INTEREST

Summer weather, basis blowouts, and the forward curve

SUMMER WEATHER FORECAST



JUNE-AUGUST TEMPERATURE FORECAST COMPARED TO AVERAGE
(WEATHER BELL)

SUMMER LEANS WARM

This winter's weak El Niño has the potential to linger into summer and influence weather forecasts in the coming months. Overall, summer is expected to lean warmer than normal, especially in population centers on the East and West coasts. This warmer temperatures will be skewed by high nighttime lows due to warm water of the eastern US. This forecast would suggest another strong summer for power demand, although perhaps not to the same extent of the record power-generation of the 2018 summer. Additionally, early forecasts for the coming hurricane season suggest lower-than-normal activity.



A TALE OF TWO INDICES: WAHA AND SUMAS

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BASIS BLOWOUTS REACH BOTH EXTREMES

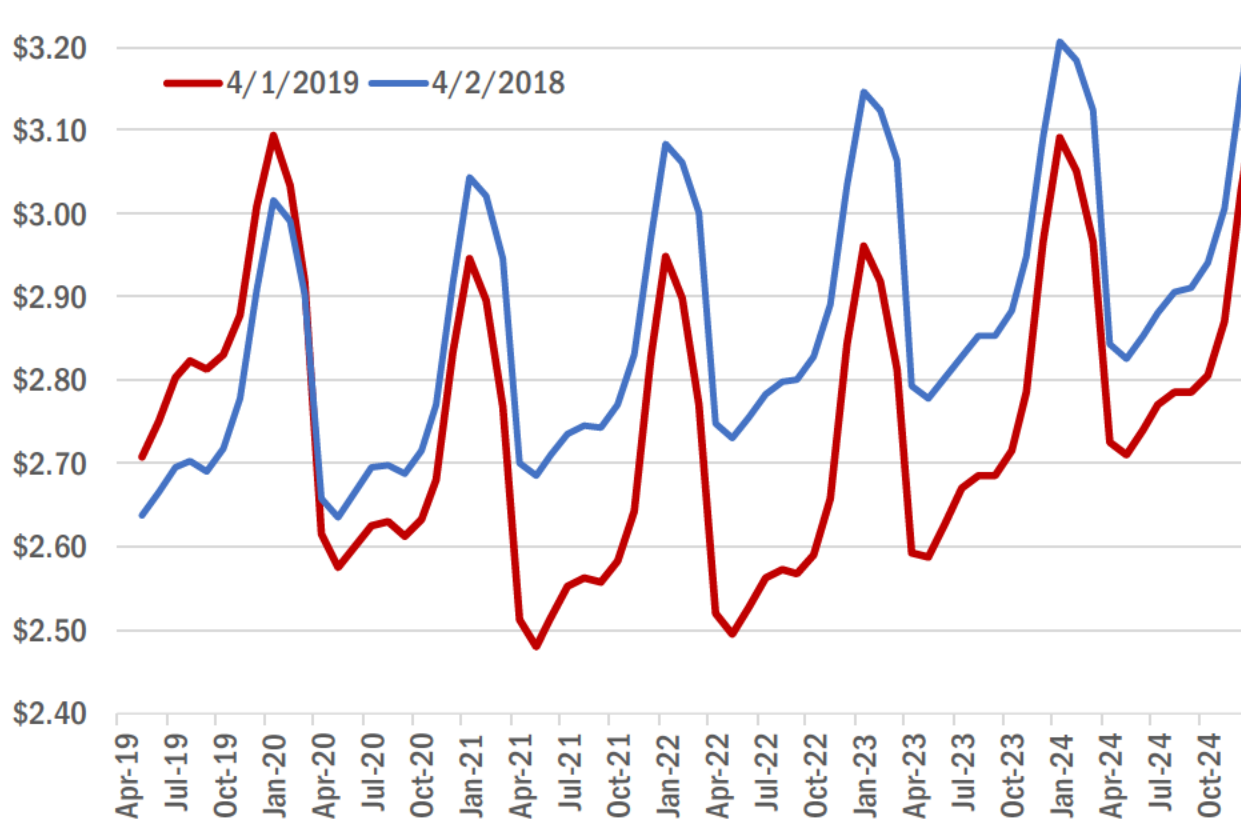
It's been the best of times and the worst of times for cash traders. In just the past two months the market has posted historic, extreme highs and lows. Sumas (Northwest Canadian Border) settled at \$159 on February 28 trading. Then, on April 2 trading, Waha tanked to a negative settle of -\$3.755.

Most will chalk to these wild prices to extreme circumstances and a confluence of unlikely events. This is true but NOBODY saw this coming, especially SUMAS. This should be a cautionary tail to those who think that volatility is dead in the post shale world. All of the shale drilling, the seemingly endless Marcellus Basin, drillable storage, couldn't stop SUMAS from making new market highs. None of us don't know the future and therefore we must guard ourselves as best as we can against threats known and unknown.



FORWARD CURVE

Forward Curve - Year over Year (\$/MMBtu)



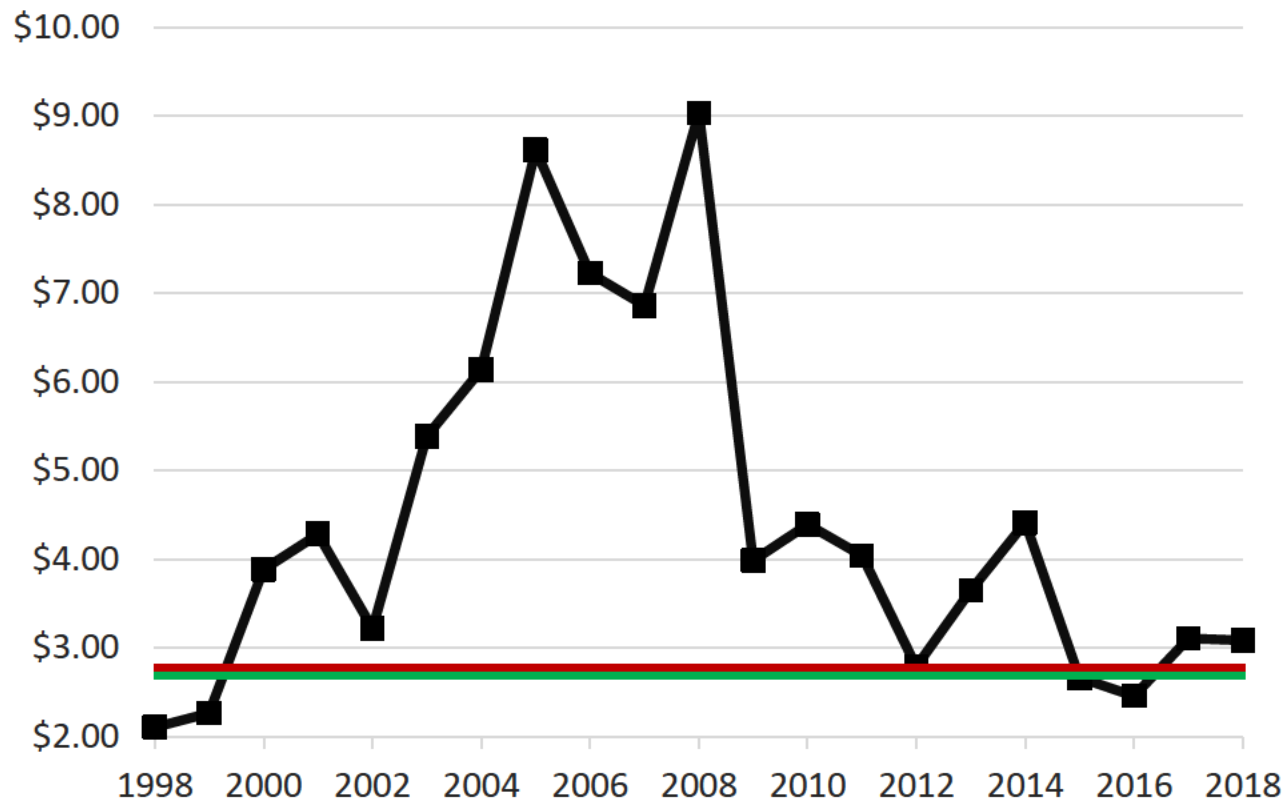
OPPORTUNITY IN YEARS TWO AND THREE

The forward curve shows a discount down the curve particularly in the years 2021 and 2022. Due to significant uncertainty and the potential for a tighter market by 2020, we believe these buying opportunities are of a tremendous value. The current backwardation in the forward strip results in higher prices and as the volatility of the futures contracts become current, and it is unclear how long these suppressed forward prices will last.



COMPARING 2020, 2021 TO HISTORICALS

NYMEX Expirations



2008	\$9.03
2005	\$8.62
2006	\$7.23
2007	\$6.86
2004	\$6.14
2003	\$5.39
2014	\$4.41
2010	\$4.39
2001	\$4.28
2011	\$4.04
2009	\$3.99
2000	\$3.89
2013	\$3.65
2002	\$3.22
2017	\$3.11
2018	\$3.09
2019	\$2.80
2012	\$2.79
2020	\$2.70
2021	\$2.66
2015	\$2.66
2016	\$2.46

2020 Strip - \$2.70

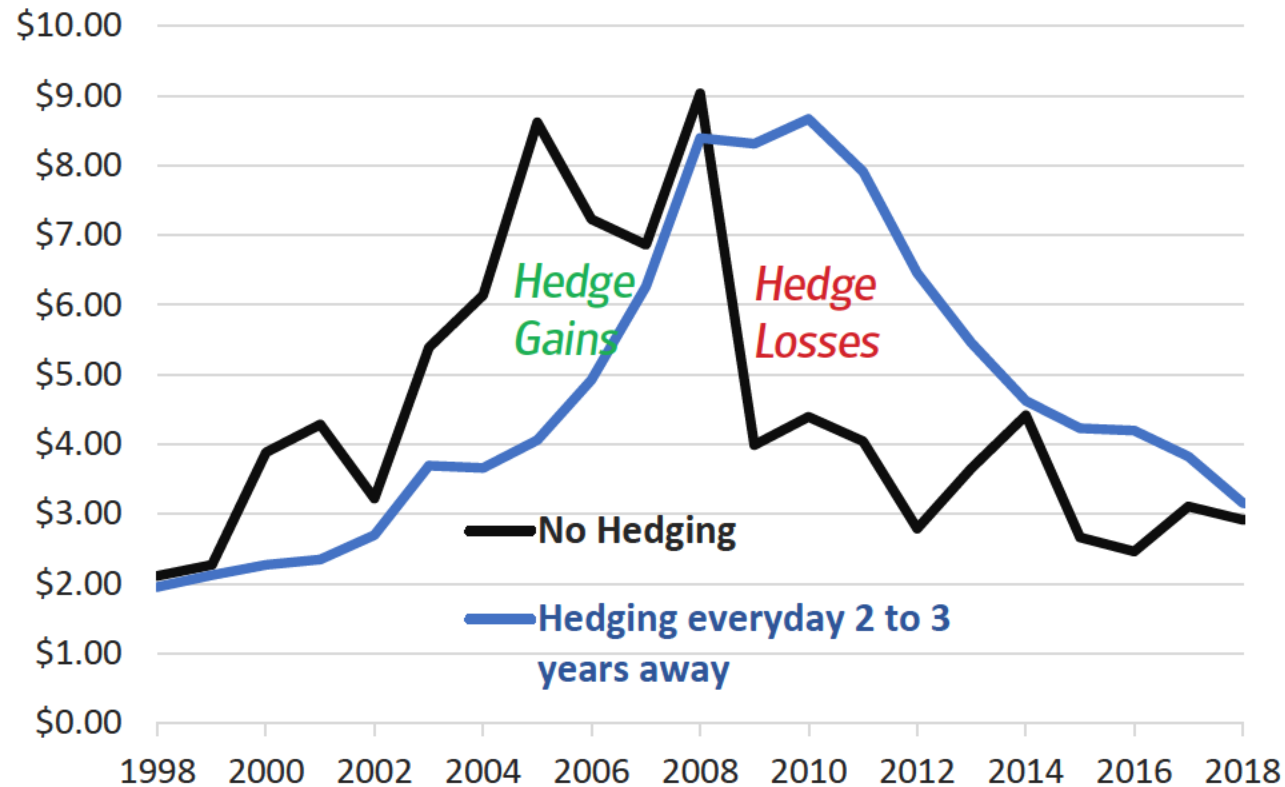
2021 Strip - \$2.66

BOTH 2020 AND 2021 TRADING BELOW \$2.70

The current 2020 strip price of \$2.70 and the current 2021 strip price of \$2.66 fair well against historical annual NYMEX expirations. Since 2000, the lowest annual average is 2016 at \$2.46.

DON'T THROW THE TOWEL ON HEDGING

Natural Gas Prices - NYMEX Henry Hub



SCORECARD OF HEDGING

The above looks at the annual average of NYMEX unhedged expirations (black line) against hedging everyday two to three years away (blue line). From 1998 through 2008, hedging produced huge gains. The next 10 years were a different story as the same hedging strategy produced huge losses. However in 2018 the hedging strategy broke even. With forward prices near historic lows, hedging is proving favorable again.



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PRICE FORECAST AND KEY CONCLUSIONS



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FURTHER DISCUSSION

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