

Natural Gas Consumption Declining As Prices Rise?

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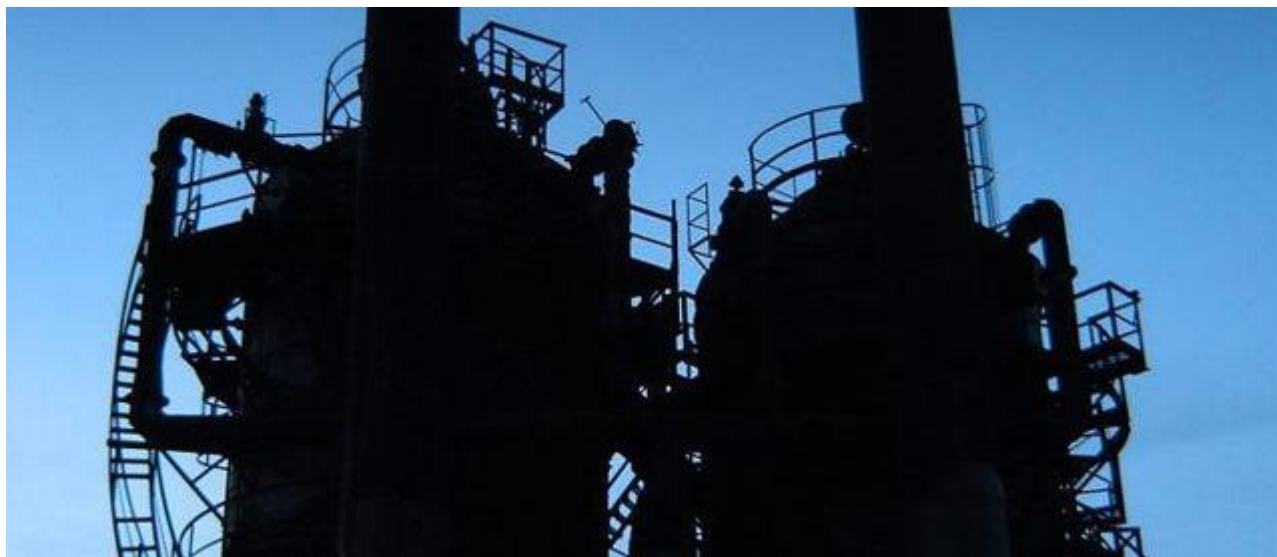
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Research
analyst,

Summary

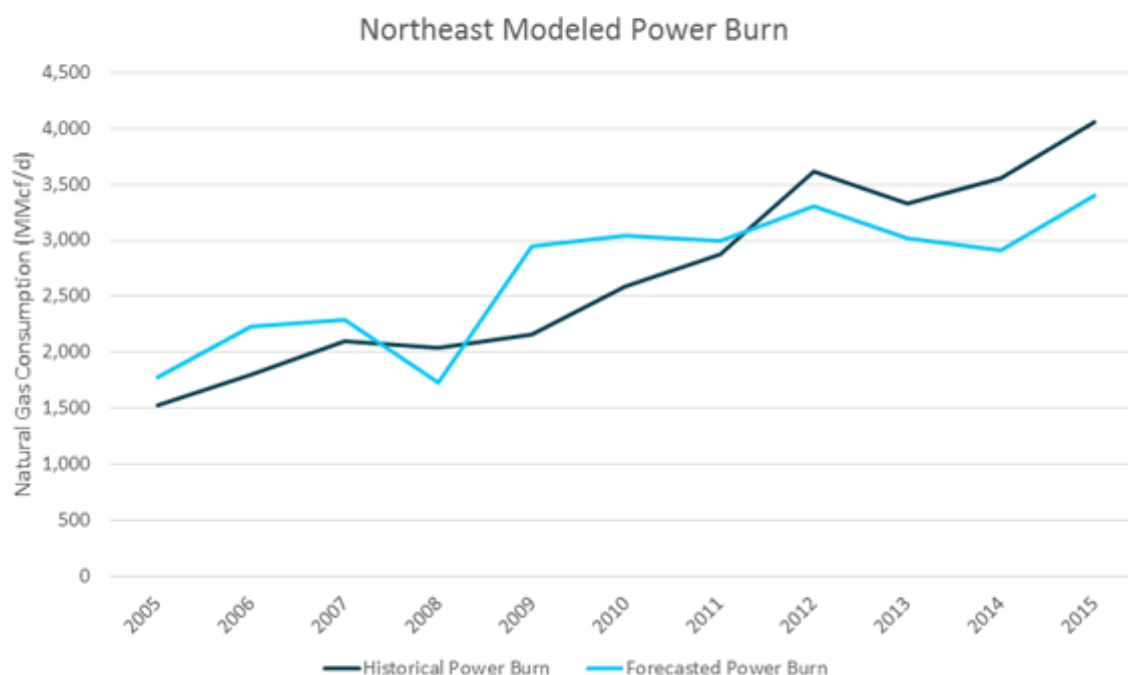
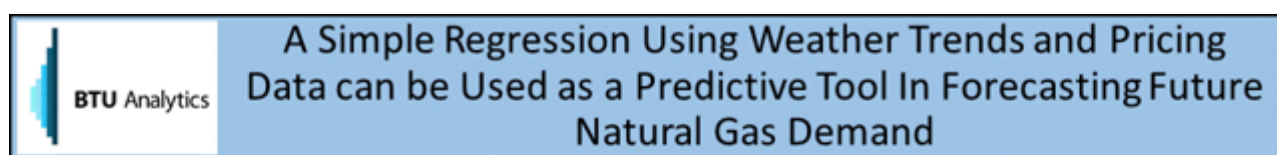
- Regression models driven by weather trends and pricing data can be used as a simple predictive tool in forecasting natural gas demand.
- The Northeast has high demand sensitivity to natural gas prices due to high coal to gas switching potential.
- Texas gas demand has a lower dependence on natural gas prices because of its inability to switch to other power sources in the stack.



United States natural gas consumption in the power sector is influenced by many factors such as pricing, weather, population growth, and infrastructure development. In addition, different regions are subject to these factors at various levels of importance. Today, BTU Analytics wanted to highlight the impact of natural gas prices on natural gas consumption from the [power sector](#). This analysis utilizes a simplified model for

predicting natural gas power burn and examines the price dependency of that segment of the market for two different regions.

BTU Analytics developed a simple regression model incorporating regional prices (Dominion South) and population weighted temperatures to model natural gas power burn in the Northeast market (Ohio, Tennessee, West Virginia, Pennsylvania, New York, and Kentucky) in order to estimate future natural gas consumption in the power market. While other factors would need to be included to fully capture the nuances involved in predicting natural gas power burn values, this simple model allows us to focus in and examine the dependency of a particular variable such as price on the natural gas power burn forecast.

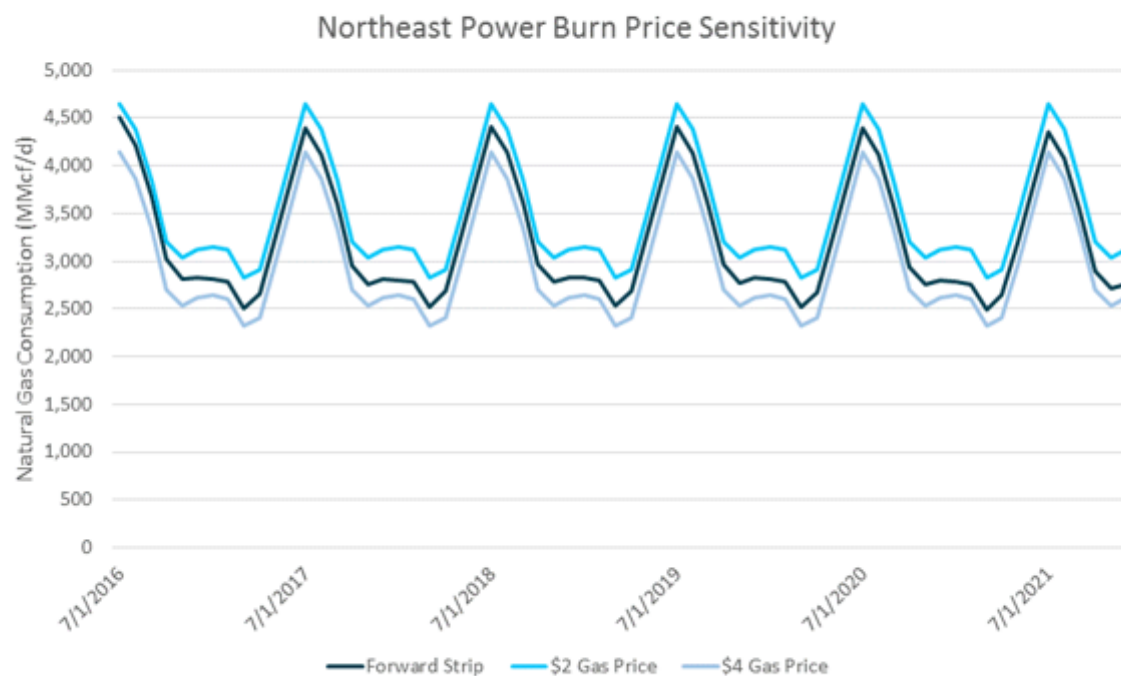
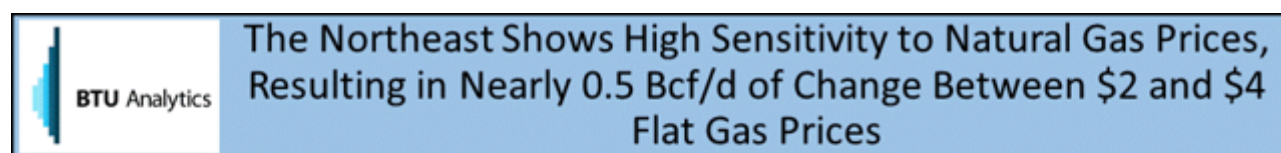


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The chart above highlights the historical results of the model compared to actual consumption levels. The deviation in 2009 was driven primarily by the stickiness of coal generation. Long term coal contracts prevented some electric generators from switching despite the lower prices experienced in 2009. Similarly, natural gas prices would indicate lower natural gas consumption levels in 2013 and 2014 when prices were higher driven by record cold winters. These deviations are mainly due to the lack of the additional

model parameters needed to describe long term trends such as pipeline infrastructure development, fuel contracting, and power generation capacity additions and retirements. This highlights the importance of understanding additional market forces when analyzing historical data and prognosticating on the future. For the purposes of today's article, however, this simplified version will be sufficient to highlight the impact of natural gas prices on regional natural gas consumption. Since weather patterns are out of our control, let's examine how the model is affected by pricing changes going forward. To generate the forecast, average monthly temperatures from the last 5 years were used for future weather estimations along with the forward pricing strip as of June 13, 2016, for natural gas. The chart below compares the estimated future consumption of natural gas at forward strip pricing compared to a flat \$2/MMbtu and \$4/Mcf gas prices.



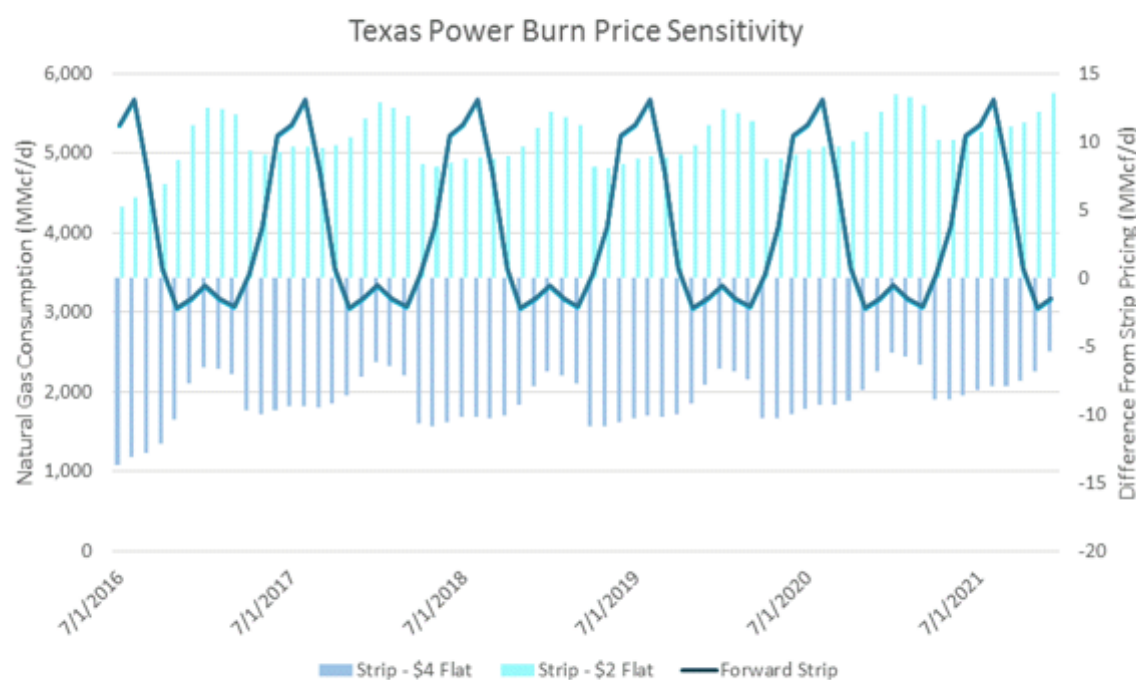
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Both the \$2 and \$4/MMbtu case result in natural gas consumption rising or falling by about 0.25 Bcf/d compared to the current natural gas strip price. There is a clear trend that when gas prices are higher, there is less incentive for power burn growth and the result is lowered natural gas consumption for that region. The high price sensitivity in this region is strongly related to the [coal to gas switching](#) potential of the Northeast, resulting in an average power burn difference of 15% between the \$2/Mcf and \$4/Mcf

cases. As gas prices move higher and coal becomes more competitive, the available infrastructure for switching allows the supply stack to shift towards the cheaper fuel source. The impact of such a large demand shift can greatly affect the overall supply and demand balance of the US. Other regions, however, show very different results when examining their power burn sensitivity towards gas prices utilizing this same approach. For example the chart below shows the same sensitivity analysis for Texas, but uses Henry Hub prices instead of Dominion South.

BTU Analytics **Texas Has Only a Small Correlation with Natural Gas Prices Due to the Lack of Switching Ability to Other Power Sources Such as Coal**



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Due to the small changes, the price variations are shown on the secondary axis. As highlighted, the price sensitivity of Texas is significantly lower than that of the Northeast region. The same metric of changes between \$2 and \$4 gas shows just a 0.5% variation in power burn. Part of the reason for this is their lack of flexibility in the Electric Reliability Council of Texas (ERCOT) grid and the inability to switch coal fired generation for natural gas fired generation. With less infrastructure able to utilize natural gas when gas prices decrease, natural gas power burn in Texas has only weakly correlated to price changes and natural gas power burn demand has been relatively unaffected by Henry Hub pricing.

While this is a simplified model focusing in on dependency, the analysis highlights the importance of understanding the intricacies of individual markets on estimating future natural gas consumption. For additional analysis on the outlook for natural gas demand request a trial of BTU Analytics' [Northeast Quarterly](#).

Disclosure: I/we have no positions in any stocks mentioned, and no plans to initiate any positions within the next 72 hours.

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