The reality is that the price of natural gas continues to be volatile, even over short time periods.

FOREWORD

In December of 2014, PACE wrote that the role of natural gas in the energy portfolio of U.S. electricity production has officially surpassed that of coal according to official figures from the Energy Information Administration. A number of factors made this possible. These included regulations from the Environmental Protection Agency that made the use of coal-fired power generation more difficult and more expensive, an abundance of domestic natural gas reserves that drove down the price of natural gas relative to coal, and potential carbon regulations and taxes that tended to favor natural gas because of its lower emissions profile.

The growing deployment of solar, too, has implications for natural gas use. As utilities continue investing in large-scale solar projects, and as home owners make similar investments in rooftop photovoltaic systems, the role of natural gas also grows, since the intermittency of solar resources is best resolved by quickstart natural gas turbines. A confluence of forces, including greater use of solar power, has continued to increase demand for natural gas.

In a 2015 white paper that discussed the relationship between solar power and natural gas, we explained that “placing more and more ‘eggs’ in the natural gas basket doesn’t come without some risk.” At the time of that publication in December of 2015, the price of natural gas had reached a 14-year low of around $1.88 per million BTU. In the middle of March of 2017, the price was around $3.04 per million BTU. Back up just three years prior to February of 2014 and the price was nearly double that at $6. Back up less than six years earlier to that to June of 2008 and the price was nearly $13. Gas prices have not made a habit of staying put.

The reality is that the price of natural gas continues to be volatile, even over short time periods. So while the average price for natural gas has declined in recent years, it is still critical that estimates about the future price of natural gas are accurate and that tools in the marketplace are available to allow both utilities and regulators to enter the future with more certainty and greater control.

It has been clear for years, and it is even more clear today, that natural gas will continue to be a significant and growing part of the production portfolio of U.S. electric utilities. In that light, the use of natural gas hedging also becomes more critical.

Historically, hedging has allowed utilities to navigate the volatility of changing factors such as weather without creating constant sticker shock for their customers. Whether a mild winter and low electricity use combine to create a glut of natural gas, or whether a harsh winter drives up prices, utilities that combine hedging with smart forecasting are better able to stabilize their power prices.

In Georgia, for example, an analysis in December of 2015 revealed that a mere $1 increase in the price per million BTU of natural gas would have cost Georgia Power customers about $100 million in 2007, but $300 million today, if not for hedging strategies that the state’s utilities were able to employ. In Florida, a state that relies heavily on natural gas use for electricity production, regulatory staff have affirmed, too, that natural gas hedging remains in the best interest of customers.
"Staff believes, while natural gas prices have trended down, price volatility is uncertain and cannot be reliably forecasted," Florida Public Service Commission staff reported in November of 2015. "What is known is that, without hedging, customers have very significant exposure to natural gas price volatility."

Nationwide, utilities continue to use natural gas hedging as an instrument of stability on behalf of customers.

"Customers must be protected, and natural gas hedging provides a built-in safety net to do just that," PACE wrote in December 2015. "Especially for utilities in regions with wild temperature swings, such as the Southeast, hedging is an indispensable tool."

THE MECHANICS OF NATURAL GAS HEDGING

Commodity goods are raw materials or primary agricultural products such as wheat, copper, or fuel that are subject to the laws of supply and demand, similar to other consumer products. Yet commodity goods are fully interchangeable. For example, a bushel of wheat can be substituted for another bushel of wheat, an ounce of gold for another ounce of gold, or a BTU of natural gas for another BTU of natural gas. This interchangeability plays a fundamental role in how the price of commodities are set as compared to other commercial or consumer products.

For example, a consumer comparing the Apple iPhone and the Samsung Galaxy would be weighing the options between two types of essentially the same product. Both are high-powered mobile computing devices that provide voice and digital communication. However, the market price for each device is determined by a number of factors, including perceived value of each brand, appearance and functionality, and general perceptions of quality. Consumer preference for different devices is central to how pricing is established in the marketplace.

For commodities, the controlling factor for setting prices is the push and pull of supply and demand in the open market. The availability of the product, as opposed to customer preference, drives the price. This creates an inherent variability in commodity pricing due to unexpected changes in supply or demand. When the supply of a commodity in the global market shrinks, prices can spike. This famously happened during the 1970s oil crisis. When there is a glut of a certain commodity in the market, prices can drop sharply. This kind of price volatility creates a financial risk for many industries including energy generation.

To protect retail customers from these unpredictable costs, many electric utilities began the practice of financial hedging of natural gas, and other fuel sources, in the late 1990’s and early 2000’s. The practice of natural gas hedging by electric utilities is akin to purchasing an insurance plan against significant price fluctuations. To smooth out daily variances in the price of natural gas, utilities can use a hedging mechanism that simply locks in a certain amount of the resource to be purchased at a later date for an agreed upon price.

For example:

- **Figure 1A:** Henry Hub Natural Gas Spot Price Dollars per Million Btu 2005 - 2017
- **Figure 1B:** Henry Hub Natural Gas Spot Price Dollars per Million Btu 2015 - 2017


"The practice of natural gas hedging by electric utilities is akin to purchasing an insurance plan against significant price fluctuations."
“By levelizing the cost of natural gas over time, electric utilities are better able to predict the fuel costs for producing electricity from natural gas. This yields more predictable prices for customers.”

As FIGURE 1A and FIGURE 1B show, while the recent average price of natural gas has declined relative to the highs of the early-mid 2000’s, there is still extreme volatility in day-to-day pricing with sharp and unexpected fluctuations.

Often, utility regulators such as public service commissions allow utilities to recover the cost of natural gas hedging instruments, as their purpose is to stabilize the price of electricity. By leveling the cost of natural gas over time, electric utilities are better able to predict the fuel costs for producing electricity from natural gas. This yields more predictable prices for customers.

In some cases, prices remain relatively flat for a period of time, meaning that investments made in natural gas hedging were similar to insurance policies that offered no return. That does not mean, however, that the hedge offered no value. After all, hedging mechanisms are meant to diminish risk and uncertainty and enhance stability. The value is in the peace of mind they bring for long-term planning.

A TOOL FOR UTILITY REGULATORS

Natural gas and electricity futures contracts were introduced in the early and mid-1990s. Today, there are hundreds of natural gas futures, options, and cleared swaps contracts available to market participants that cover various delivery points, quantities, and time spans.

Regulators began taking a serious look at utility hedging after a series of particularly severe natural gas price spikes. Prices rose to a then-record of $10 per million BTUs in late 2000 and again in 2003, then skyrocketed up to an all-time high of $15 in 2005 after Hurricane Katrina. Prices spiked again at more than $13 in 2008.

In reaction to these variations, former Colorado Public Utilities Commissioner Matt Baker said his agency looked at risk aversion starting with the planning process.

“We’re trying to get utilities to create enough fuel diversity between coal, gas, wind, and energy efficiency and demand response, so that consumers have protection if one commodity gets out of line,” Baker explained. “On the gas side, we’ve encouraged our utilities to enter into long-term, fixed-price physical contracts.”

Due to recent low natural gas prices, many utility regulators have felt pressure to place hard dollar caps on natural gas hedging or to enforce pauses in an attempt to find the floor for natural gas prices. Other regulatory bodies have remained steadfast in their belief that natural gas hedging works for customers.

In December 2015, for example, the Georgia Public Service Commission voted unanimously in favor of continuing the practice of natural gas hedging. Utility regulators in Georgia agreed that the price of natural gas was so low that it is likely to begin increasing again in the near- to medium-term.

“Gas prices are so low, how much lower can they go?” Georgia Public Service Chairman Chuck Eaton said.

Commissioner Stan Wise agreed, saying that the move to bring back natural gas hedging, “Gives [Georgia Power Company] the ability to protect ratepayers from volatility in the natural gas market”.

THE IMPORTANCE OF NATURAL GAS HEDGING IN FLORIDA

With almost no in-state production of oil, coal, or natural gas, Florida for decades has relied heavily on imports for its energy needs. These energy imports include a substantial amount of electricity, much of which is produced from natural gas. In fact, Florida today is the second largest user of natural gas for electricity in the nation.
In addition, compliance with recent federal emissions regulations has meant an even greater increase in reliance on natural gas as Florida utilities have moved away from coal as an electricity source. In fact, the role of natural gas in Florida’s electricity production has increased from 48% in 2008 to more than 60% in 2015, meaning that Florida ratepayers have seen a marked increase in their exposure to natural gas prices in the past decade.

With marketplace realities incentivizing more natural gas use by utilities nationwide, and federal regulation all but forcing it, it is clear that Florida’s electricity customers are poised to become even more exposed to natural gas prices than they are today. Other factors, such as the growing role of solar power in the Sunshine State, also contribute to the state’s increasing move toward natural gas as an electricity production source.

Florida utilities, as well as many homeowners, continue to make investments in solar technology. But as the amount of solar power capacity grows, so will the need for quick-start natural gas turbines. Today, these fast-acting natural gas turbines are typically the cheapest way to maintain the stability of the electric grid when integrating large amounts of solar power. More solar power will mean more natural gas use.

Many, including PACE, have raised red flags about the inherent danger of too much reliance on any single power resource. Even environmental groups such as the Union of Concerned Scientists have warned that Florida’s high reliance on natural gas for electricity creates risk for customers.

Clearly, Florida will become even more dependent on natural gas in the years to come, making the price of natural gas a key metric driving the cost of power delivery for Florida customers. Natural gas hedging can help smooth this transition to more natural gas by providing much-needed insurance against future price spikes.

CONCLUSION

The topic of natural gas hedging has generated robust debate in Florida, with the state’s Public Service Commission in November 2015 taking action to pause the use of natural gas hedging by state utilities through 2017. This short-term move was intended to allow greater scrutiny about the way that natural gas hedges are used by Florida utilities and to determine how best to improve those instruments.

To be certain, though, natural gas hedging should not be abandoned altogether as a way to protect the long-term stability of power pricing, as regulatory staff in Florida has argued in past reports. PACE agrees, believing strongly that the best interests of customers are served by a regulatory environment that allows the use of natural gas hedging.

As this paper has shown, a number of factors have combined to increase the use of natural gas in electricity generation. These include federal regulations that diminish the use of coal, significant increases in the availability of inexpensive domestic natural gas, a general move toward an energy production future with a lower carbon footprint, and the growing use of solar power resources that are typically backed up by natural gas turbine technology. All of these forces serve to enhance demand for natural gas, creating long-term upward pressure on the price of the commodity. Eventually, more natural gas use will lead to higher natural gas prices.

Electricity customers everywhere, but especially electricity customers in Florida, remain vulnerable to swings in natural gas prices. Smart public policy should recognize this reality and allow electricity providers and their regulators the freedom to protect customers through hedges that create long-term price stability.

“With marketplace realities incentivizing more natural gas use by utilities nationwide, and federal regulation all but forcing it, it is clear that Florida’s electricity customers are poised to become even more exposed to natural gas prices than they are today.”