Public Service Commission of West Virginia

Natural Gas Supply – Demand Forecast Report for 2017 – 2026

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Executive Summary

This report presents general information regarding the current natural gas supply and demand conditions as well as future natural gas supply and demand over the 2017-2026 period in West Virginia. Information sources for natural gas oriented government agencies, industry groups and other organizations are provided at the end of the report. Those organizations include the Federal Energy Information Administration (EIA), the Colorado School of Mines Potential Gas Committee, the American Gas Association (AGA) and the Natural Gas Price Outlook from Energy Solutions, Inc. among others.

The *Gas Utilities Supply-Demand Forecast 2017-2026* is similar to previous reports, primarily because (i) the actual flowing supplies match all demand in the State at all times (except for minimal unplanned outages), (ii) the capacity of unrestrained production far exceeds the current and future projected demand, (iii) shale gas development is still occurring, and (iv) there have been no significant identified additions to current or projected demands on utility systems in the State, which includes no power production fuel switching involving natural gas public utilities. Therefore, the only changes made are to update the forecast date range, to comment on the likely effects of Senate Bill 390 (passed by the 2015 Legislature) and updated market price forecasts.

The 64th West Virginia Legislature (1979) stated in West Virginia Code §24-1-1(d)(3) that the Commission will, as part of an annual *Management Summary Report*, describe in a concise manner "the current balance of supply and demand for natural gas and electric utility services in the State and forecast the probable balance for the next ten years."

Prior to 1979, the wholesale price of natural gas was regulated and capped by the Federal Government. There was some concern at that time that suppliers of natural gas were reluctant to produce and market their supplies and that exploration for new supplies was somewhat curtailed due to what some believed to be artificially low and unprofitable wholesale prices. The Legislature was concerned about these factors and was interested in learning more about the natural gas production industry in West Virginia and what role the Legislature might play in it.

Prior to the passage of the Federal Natural Gas Policy Act of 1978 (NGPA), the natural gas market was experiencing production shortages that many believed were a direct result of Federal price controls. The NGPA addressed the situation by devising a schedule of price decontrol over time, reducing barriers between interstate and intrastate markets, and providing incentives for gas exploration and development. Today, wholesale natural gas prices are market driven and are subject to various market forces, much like the prices of any other publicly-traded commodity.

West Virginia is a major gas producing state and exports far more native production gas than it consumes. The State also has multiple access points to interstate gas from other production areas and major gas storage areas. This report focuses on the physical availability of supplies of natural gas and the outlook for the next ten years. Based on recent developments of "unconventional" natural gas reserves in the Appalachian Basin and elsewhere in the United States, there is more than an ample supply for the coming decade and beyond.

The Natural Gas Utility Position section of the report sets out basic information provided by the major natural gas public utilities in the State, and shows that the expected demand of all customer classes is essentially flat for the next ten years, as it has generally been for the past two decades or so.

Included again in this year's report are some concerns regarding peripheral issues related to general supply and demand and some more localized concerns that certain trends call to attention.

Natural gas public utilities buy gas based primarily on a national market price basis, and recover those costs through rates that contain additional storage and transportation costs and adjustments due to past-period over- or under-recoveries of gas costs.

Genesis of Report and the Current Situation

Language in W. Va. Code §24-1-1(d)(3) indicates that the Legislature was interested in the gas industry as it existed and operated in the early to late 1970s and into the early 1980s. Prior to the passage of the NGPA in 1978, and for the first few years afterward, natural gas prices at the wellhead were regulated with a maximum allowable price. As production costs escalated with inflation, the producers saw their profits decrease to the point that it was no longer attractive to investors and owners to drill new wells or, in some situations, continue to produce wells that had already been put into production, therefore increasing the Legislative interest in shut-in wells.

The situation became so severe that there were moratoria put into place restricting the addition of new distribution customers, essentially nationwide. This resulted in an increase of all-electric housing and businesses expanding in metropolitan areas of the country.

The Industrial Fuel Use Act of 1978 was enacted, which dictated the allowable uses of natural gas by industry. The use of natural gas in industrial boilers, including for the generation of electricity, was not allowed. This led to conversion of boilers to fuel oil and reduced natural gas use in industrial boilers.

The Natural Gas Utilization Act of 1987 repealed much of the Fuel Use Act at about the same time wellhead prices became fully deregulated under the NGPA, and the commodity began trading on a national commodity market basis. Both supply and demand, as well as prices, rose significantly. These actions greatly reduced concerns over adequate supplies in the near term.

After about 2007, and continuing today, huge new supplies of gas are becoming available and recoverable due to advances in deep well and horizontal drilling technology and economic feasibility, along with the accompanying hydraulic fracturing process. Although there are some issues with the practice that remain to be addressed, the vast majority of experts in the industry and regulatory world expect the practice to continue and become even more efficient and productive. Estimates by industry, government and academia show there is more than ample supply for the long term, with most saying there is a recoverable supply in North America to cover needs for 100 years or more. The abundance has driven the price of natural gas to near record low levels as compared to prices over the last 25 years. There continues to be a large increase in the use of gas for electric generation and other industrial applications, and the exporting of liquefied natural gas to other countries has begun.

Because of the dramatic changes in the industry (which are mirrored by production and consumption activities in the Appalachian Region and West Virginia), the Commission has also decided to include the current status of a robust natural gas supply market as opposed to limiting the discussion to the supply side concerns of forty years ago.

Marcellus Shale Impact on Supply

The feasibility of extracting natural gas from the Marcellus Shale formation in the Appalachian Region has resulted in increased drilling and production activity in West Virginia over the past 11 years. This gas has long been known to exist in the formation, but until improvements in deep well and horizontal drilling capabilities were made, the resource was not attractive to producers and consumers. After 2006, the supply has grown to the extent of driving wellhead prices down to a level where new drilling is slowing. Recently, production activities have shifted to oil-bearing areas in the Eastern United States formations, most notably the Utica Shale that is predominately in Ohio, and to “wet” gas zones in the Marcellus formation. This shift in production activities may slow, but will not eliminate, production of natural gas from non-traditional formations. As producers develop oil bearing formations, gas that coexists with the oil must also be produced.

Because demand has not kept up with supply, there is currently activity aimed at preparing to export more liquefied natural gas from the United States to foreign markets.

There is also increased activity to encourage the use of compressed natural gas as vehicular fuel. Because of the low prices and environmental regulatory actions regarding air quality, natural gas use for electric generation is increasing dramatically, including in West Virginia. Despite all these demand increases, there remain expectations of some increases in price as compared to the recent extreme lows, but prices will still remain relatively low. In its *Short-Term Energy Outlook*, released in November 2016, the U.S. Energy Information Administration (EIA) indicated that it expects prices to rise somewhat through 2017. EIA expects the Henry Hub price will average $3.12 per MMBtu in 2017 compared to $2.50 in 2016.

Local and Regional Concerns

The Marcellus drilling activity is creating some concerns on the supply side in terms of what is happening to conventional local production supplies and the midstream gathering pipelines that carry it, as well as some interstate pipelines upon which local distribution companies rely for supply deliveries.

There are several issues for consideration. Much of the Marcellus gas is "wet" and contains high levels of heavier hydrocarbons and water vapor. Higher pressures are being used in existing and new pipelines carrying Marcellus gas. Existing conventional production is declining and new conventional drilling is slowing as producers focus on what is perceived to be the more lucrative Marcellus production.

Wet gas has special handling and treatment needs. The heavier hydrocarbons, such as propane, butane, ethane, etc., cause the gas to have significantly higher BTU content, which is sometimes not tolerated well, or is even unusable, in today's modern high-efficiency appliances. This requires more stripping to make the gas useable in normal consumer gas-using appliances. Because the hydrocarbons often condense out of the gas and collect in the pipelines and other gas handling equipment, the pipelines must be cleaned frequently. This causes planned and occasional unplanned outages. Drier gas from conventional production fields is more likely to be useable by customers upstream of drying facilities. Marcellus gas customers along the gathering pipelines and transmission upstream of compression and drying equipment must take precautions to accommodate the wetter gas and may even have to abandon their traditional field-line-quality sources of supply.

Continued availability of natural gas to many rural customers may also be affected by the higher pressures typically used in pipelines transporting Marcellus gas to facilitate the production and transportation of much higher gas volumes. Producers and transporters are reluctant to allow customers on higher pressure pipelines for liability and operational reasons. Additional pressure regulating equipment may be necessary at a substantial cost.

Conventional production from existing wells is declining in some areas of the State as producers focus on the higher value Marcellus production. Many of the conventional wells are marginal producers and are not worth reworking or even maintaining. As a result, those wells are left to produce what they can in their remaining life and then are capped and eventually plugged. Volumes in field lines from those depleting existing wells will be reduced and pipelines will increasingly be in danger of being abandoned. This is having, and will continue to have, the effect of local pockets of field-line customers being abandoned. Some distribution areas served by local distribution companies are in danger of losing access to sufficient quantities of gas. Additionally, large amounts of capital, that would normally be used to fund new conventional drilling, are being redirected to the Marcellus and other shale formations, leaving conventional gas in the ground in various parts of the State, primarily Southern West Virginia.

One other area of concern is the uncertainty regarding governmental actions that could affect hydraulic fracturing (fracking). Even after there is a complete review by the EPA, there will likely be continued opposition to fracking. Although the EPA has been studying fracking, no final report has been issued as of this writing. In the meantime, there will be continuing outcry by many groups concerned that fracking can impact water supply sources.

In December 2012, the EPA issued a progress report on its detailed, multifaceted study that includes data gathered from hundreds of natural gas and oil wells across the country. In its progress report, the EPA listed major areas of the fracking water cycle that it is studying. They include the impact of large water supply withdrawals to provide the fracking water, the possible impacts of surface spills on drinking water sources, the effects of injection and the fracturing process on drinking water supplies, how fracking wastewater could affect water supplies and the possible effects of inadequate treatment of fracking wastewater. To date, there is no significant evidence of groundwater contamination due to the practice. A draft of the EPA report was released in August 2015 for public comment and peer review. Additionally, more recent concerns have arisen concerning increased seismic activity that may be related to fracking.

Natural Gas Utility Positions

As with past years' *Natural Gas Utilities Supply-Demand Forecast Report*, the largest natural gas utilities operating in the State provided information regarding their long-term (ten-year) supply and demand projections. Their responses show that very little change is expected in demand over what was reported last year. However, two disclaimers should be noted. First, electric generation operators are studying the economic and environmental feasibility of either switching to natural gas as the sole fuel

or using some combination of natural gas and coal in existing plants. They are also factoring in the use of natural gas in planning new generation plants.

Second is the possibility of using more natural gas as feedstock for the production of ethylene and other byproducts, which would, in turn, be used primarily for chemical manufacturing and production of plastics. This activity is in the early to mid-stages of study, and it is not certain whether the suppliers would be the public gas utilities or some other entities in the private gas industry. Also, the passage of Senate Bill 390 by the 2015 Legislature will almost certainly lead to increased expansion of gas utility infrastructure into unserved and under-served areas of the State. At this point, however, it is difficult to estimate what volumes would be involved in these activities and, therefore, this report will only state that the utilities support the use of basically flat numbers in their demand forecasts for the next ten years. It is noted that certain areas of the State may experience declines in gas demand due to shrinking populations and certain industrial declines. These issues will be addressed in future reports when further developments emerge.

Conclusion

Based on the information reviewed by the Commission Staff, West Virginia and the United States have more than sufficient supplies of natural gas available to meet demand for the next ten years (2017-2026) and well beyond. The State's natural gas utilities predict ample supplies for their systems and, at this point in time, basically flat demand for the coming decade, although they are keeping a watchful eye on possible developments in the electric and chemical industries for what could create large increases in demand. Though system upgrades would be necessary if this occurs, there is high confidence that the available supply will be more than enough to meet that demand.

References and Additional Information

State Government

- West Virginia Department of Environmental Protection www.dep.wv.gov

Federal Government:

- National Petroleum Council (NPC)
  Balancing Natural Gas Policy (2003) www.npc.org

- Energy Information Administration (EIA) http://www.eia.gov/naturalgas/

Producers:

- Natural Gas Supply Association (NGSA)Winter Outlook www.ngsa.org

Interstate Pipelines:

- Interstate Natural Gas Association of America (INGA) www.ingaa.org

Local Distribution Companies:

- American Gas Association (AGA) www.aga.org

Research:

- National Regulatory Research Institute (NRRI) www.nrri.org

- Colorado School of Mines Potential Gas Committee www.potentialgas.org

- Natural Gas Price Outlook www.naturalgasoutlook.com