Public Service Commission of West Virginia

Supply-Demand Forecast For Gas Utilities

2012-2021

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Overview

This Report is in response to a legislative mandate and is part of a comprehensive Management Summary Report submitted annually to the West Virginia Legislature.

The sixty-fourth West Virginia Legislature (1979) stated in W. Va. Code § 24-1-1(d) (3) that the Public Service Commission of West Virginia (Commission), as part of an annual Management Summary Report, should describe in a concise manner "the current balance of supply and demand for natural gas and electric utility services in the state and forecast of the probable balance for the next ten years."

Prior to 1979, and for several years thereafter, the wholesale price of natural gas was regulated and capped by the Federal Government. There was 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 because of what some believed to be artificially low and unprofitable wholesale prices. The Legislature, in the 1979 Act, expressed concern about these factors and indicated that it wanted to be kept abreast of natural gas production in West Virginia and its role in the natural gas utility industry.

Prior to the passage of the Federal Natural Gas Policy Act of 1978 (NGPA), the natural gas market was influenced by production shortages resulting from 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 by and large, market driven and are subject to various market forces, much like the prices of any other publicly-traded commodity.

This Report focuses on the physical availability of supplies of natural gas and the outlook for the future, specifically the next ten years. Based on recent developments of "unconventional" natural gas reserves in the Appalachian Basin and elsewhere in the United States, there appears to be more than an ample supply for the coming decade and beyond. The Appendix and Attachment to this Report provide several resources that support this belief. West Virginia is a major gas producing state and exports far more gas than it consumes.

The demand portion of the Report relies mainly on information and forecasts provided by the three largest gas utilities in the State. The throughput of those utilities, including sales and transported gas, accounts for the vast majority of the total throughput of all the gas utilities in the State, and the forecasts represent general overall trends.

The following summary of the average annual growth rates of total company natural gas demand for the period 2012-2021 flows from the forecasts of the three major utilities:

Company	**Company Projected Average Annual Throughput Growth Rate**
Mountaineer Gas Company	-0.3 %
Hope Gas, Inc., dba Dominion Hope	0.1%
Equitable Gas Company	0.0 %
West Virginia Total Average	**-0.1 % (Rounded)**

While Equitable projects the same zero annual growth rate as reflected in last year's report, the other companies project lower growth rates than last year, thus reflecting a reduction in the overall total demand projection as compared to last year's report. A significant determinant of the level of natural gas demand is winter weather, and the Companies assume normal or historical long-term winter weather patterns over the forecast period, despite significant deviations from normal in recent heating seasons. The 2010-2011 winter temperatures were approximately 4.6% colder than the previous 2009-2010 heating season and approximately 11% colder than normal based on 30-year averages on a statewide basis. These conditions would lead to a greater demand than shown in the forecasts. Potential and inevitable weather changes should be considered when reviewing the forecasts.

The gas utilities reviewed for this report were the three major companies that serve West Virginia: Mountaineer Gas Company (Mountaineer), Hope Gas, Inc., dba Dominion Hope (Dominion Hope) and Equitable Gas Company (Equitable). Although there were nineteen active gas utilities within the State, these three major utilities made approximately 90% of the total volume of gas deliveries to residential, commercial and industrial in the State last year. Therefore, an examination of these utilities will provide an overview of the gas market that is sufficiently complete to draw meaningful inferences.

As a result of the sharp increase in prices between 1978 and 1983 as regulated prices changed to competitive prices, and the implementation of demand-side management programs, consumers in all classes reacted by reducing their consumption of natural gas. In addition, reductions occurred as a result of increased

efforts in weatherization of structures, improved appliance and equipment efficiencies, conscious voluntary usage reductions and switches to alternate sources of energy. These changes, brought about by higher prices, will continue to have some influence on present and future natural gas demand, even though prices have decreased. Although current prices are down significantly, market prices were at all-time record highs as recently as June 2008, which caused and will continue to cause downward pressure on demand for the near future. This, of course, caused confusion among the consuming public seeing low market prices while utilities are charging rates that are slow to respond to falling prices.

The natural gas industry, federal regulatory agencies such as the Federal Energy Regulatory Commission (FERC) and state commissions, including the Commission, have continued to develop and implement policies that allow and encourage the operation of competitive forces in the national gas market. Past developments included authorizing flexible rates, special marketing programs, negotiated transportation rates, the use of the spot market, and the futures market, hedging, derivatives and other financial tools.

Demand Analysis

The demand projection in this report has been developed independent of supply considerations, i.e., the extent of the demand for utility natural gas supplies and delivery in West Virginia has been calculated assuming no supply limitations. This notion is in accord with the State's current and medium to long-term more than adequate supply position. These demand projections include utility direct sales to ultimate customers in the residential, commercial and industrial classes, wholesale sales for resale, and transportation-only volumes, with the totals described as "throughput".

Unlike the major electric utilities that operate in West Virginia, the gas utility companies do not use highly-sophisticated modeling techniques for forecasting. The reasons for this lack of modeling sophistication are inherent in the nature of the product: natural gas is used primarily for space heating, water heating, cooking and specific commercial and industrial processes. Unlike electrical energy, gas can be stored and withdrawn from storage to satisfy an unexpected or peak market demand. Additionally, since the gas transmission and distribution system is essentially in place, plant construction is not a major concern of gas distribution companies. These companies are more concerned with commodity availability and prices. Long term contracts for gas supplies and pipeline capacity are the norm.

The ten-year forecasts presented in this report are based upon similar models and databases used in the January 2011 report. Based on reports filed with the Commission by the utility companies, the expected levels of residential, commercial and industrial deliveries were identified. Of course, the raw 1981-2010 sales and transportation data reflect the effect of weather conditions experienced during that period, the effect of curtailments because of supply deficiencies, if any, and the effect of moratoria on adding new customers.

Residential and commercial uses of gas are generally less discretionary than the industrial load because of the stock of gas-using appliances. The space heating units, water heaters, and cooking units are fixed in the short to medium-term. Therefore, in any given year, a residential and commercial user's gas consumption is frequently primarily a function of the severity of the weather[1]. With that in mind, the companies often rely heavily on some variant of a weather adjusted trend line technique to forecast residential and commercial sales.

There is more confidence associated with predictions in the near future, and ten year projections must be viewed with caution regarding demand.

[1]Weather is measured by reference to historical and "normal" heating degree days (HDD); heating degree days are a measure of the difference of average daily temperatures below 65 degrees Fahrenheit.

Residential and Commercial Demand

As indicated above, the analysis of residential and commercial demand is based upon data obtained from records of three major West Virginia gas utilities. These three companies represent about 90% of the total utility residential throughput as well as 90% of total utility natural gas throughput in the State. These utilities are, in descending order of throughput volumes:

Mountaineer Gas Company (Mountaineer)
Hope Gas, Inc., dba Dominion Hope (Dominion Hope)
Equitable Gas Company (Equitable)

Mountaineer Gas Company

Mountaineer does not anticipate any net increase in its demand throughout the forecast period (2012-2021), except through the acquisition of several small utilities. The 2001, 2002, 2003 and 2004 floods in southern West Virginia caused a significant, permanent loss of hundreds of customers. In addition, the prospect of lower natural gas usage per customer because of increasing appliance efficiency and other price and general economy-induced conservation are expected to offset some of the increase in new customer demand as well.

Mountaineer's projections for the residential and commercial customer classes can be found in Table 1 of this report. These projections reflect an average annual rate of change of -0.5% each in the residential and commercial classes from 2012 to 2021. Mountaineer's forecast for the period represents 4.9% decline in the level of demand for tariff sales compared to last year's forecast in each class. No growth is projected in transported gas levels for all customer classes, which is the same as last year.

Dominion Hope

The methodology for developing a volume forecast for Dominion Hope is similar to most gas forecasting methods and can be broken into three components: determining base load, determining heating load, and projecting customer growth. In order to determine base load, the average volumes in July and August are averaged for each rate class. Multiplying those averages by 12 provides a yearly base load for the company.

To develop a heating load, Dominion Hope utilizes temperature data from the

National Oceanic and Atmospheric Administration (NOAA) for the City of Parkersburg. This temperature data is applied to all of Dominion Hope's service territory.

Analyzing historical weather data provides expected heating degree days on a monthly basis. These expected heating degree days, used in conjunction with historical consumption, provide heat load factors used in the forecast. In order to determine customer growth for the forecast term, a regression analysis is performed, regressing historical customer counts against statistically significant demographic and economic variables. Customer growth is then multiplied by expected usage under normal weather conditions to project future usage. These projected figures are then trended in order to reflect the expectation that energy conservation will have a negative influence on projected usage.

Dominion Hope's forecasts in this Report reflect a 0.20% annual growth in residential throughput volumes and 0.13% annual growth in commercial throughput from 2012-2021. Demand forecasts for both classes have increased since last year's report. The total growth forecast is for 0.10% over the ten year period. See Table 2.

Equitable Gas Company

Equitable is an interstate gas distributor that serves portions of Pennsylvania and northern West Virginia, with each portion of the system regulated by the state in which it is operated. In 1986, Equitable was reorganized and Equitrans, Inc. was formed. A further reorganization in 2008 created today's EQT Corporation, the parent of both Equitable and Equitrans, Inc. Equitable now consists of only the distribution facilities in Pennsylvania and West Virginia. Equitrans includes the transmission, storage, and gathering facilities that were formerly part of Equitable. EQT also owns a separate production company.

Equitable reported data showing no expected change in residential demand and no change in commercial demand, compared to its 2011 forecast. The Company has stated that it expects demand and customer count to remain essentially flat for the new forecast period.

The forecast for Equitable is shown in Table 3, and included in the Total Throughput Forecast in Table 4.

Industrial Demand

The most volatile component of gas demand is the industrial sector. Major causes of this instability are three-fold. First, national economic conditions have a marked impact on industrial output and, thus, gas demand and the level of long run national economic activity cannot be predicted with complete accuracy. This is aggravated by the fact that major West Virginia industrial users are often tied to the automobile and other "consumer durable" goods industries that tend to be more volatile than the economy as a whole. Second, the industrial sector is susceptible to work stoppages and other disruptions that cause gas consumption to oscillate significantly. Third, the industrial sector has more alternate fuel capability than the residential or commercial sectors; most fuel switching occurs between natural gas, #6 and #2 fuel oil, and propane. Many firms can switch fuels on less than a day's notice.

The incentives for large industrial customers to continue to utilize both utility tariff sales service and transportation remain in place and have strengthened in recent years. FERC Order 636 makes transportation by interstate pipelines mandatory and has been fully implemented by interstate pipelines. The Commission's transportation rules in its General Order Nos. 228, 228.1 and 228.2 facilitates this process within West Virginia for local distribution companies and intrastate pipelines.

The combination of these factors makes the industrial demand forecast the most uncertain and the most susceptible to forecast error of the three customer classes evaluated.

Mountaineer Gas Company

Mountaineer has the largest volume of industrial gas deliveries, with the majority of its service territory encompassing the heavily industrialized Kanawha Valley, Ohio Valley and Eastern and Northern Panhandle regions. Mountaineer's primary industrial customers are in the metals, chemicals, glass and rubber industries. Demand by these customers is highly sensitive to changes in general business conditions, and therefore sensitive to price fluctuations in energy as energy becomes an ever-increasing percentage of the costs of making their products.

Because of recent economic declines, Mountaineer has lost significant industrial transported demand, and its projections reflect an approximate 41% reduction for the next ten years as compared to its 2009 projections (much of this is due to the idling of the aluminum plant in Jackson County). Mountaineer's projections are shown on Table 1.

Dominion Hope

Dominion Hope, like Mountaineer, forecasts industrial sales by relying heavily on individual customer contact. The major industries in Dominion Hope's service area are chemicals, glass, wood products, power generation, asphalt, and manufacturing. To forecast throughput, Dominion Hope's sales force relies on historical consumption information, projections from large industrial users and information that addresses economic conditions affecting the industries of interest. Dominion Hope's main sales objectives are: (1) to retain existing industrial throughput connected to its system; (2) to increase throughput to existing customers by promoting new, efficient gas technologies; and (3) to add new industrial customers by means of proactive economic development efforts.

Dominion Hope's forecast anticipates no growth in industrial sales and no growth in industrial transportation demand. Hope's projections, however, reflect an 8.3% increase in industrial throughput compared to its 2009 projections. They are shown on Table 2.

Equitable Gas

The industrial sales and transport forecast submitted by Equitable is shown on Table 3. The great uncertainty in this class of sales and transport has led the Company to project that a constant amount of industrial throughput will occur over the forecast period.

Company Use and Unaccounted for Gas

In addition to sales to end-use customers, West Virginia utilities use gas in their own operations, and there is a certain amount of unaccounted-for gas (UFG) each year. Based on information provided by the Companies, the following estimates reflect the percentage of total throughput that company use and UFG represented for each Company:

Mountaineer Gas	4.0%
Dominion Hope	7.2%
Equitable Gas	4.7%

Total West Virginia Demand

Table 4, contains the summary of the three major gas utilities' projected demand for 2012-2021. In order to account for the smaller utilities and UFG, this demand was increased by a factor of 1.15 to arrive at an estimate of total West Virginia demand by all of the natural gas utilities operating in this State. Based upon the Companies' projections, total West Virginia demand for natural gas is estimated to be 90,236 MMcf in 2012. The total is projected to decrease at an average annual rate of negative 0.1 % (rounded) to 89,437 MMcf in 2021.

This projection results, in part, from an expectation of the continued, but uneven, impact of national economic growth on economic conditions in West Virginia as affecting utility throughput. Another significant determinant of the level of natural gas demand is winter weather, and the Companies assume “normal” or historical long-term winter weather patterns over the forecast period, despite significant deviations from normal in recent heating seasons.

When supply prices increase and are passed to utility customers, there will be downward pressure on consumption. Although Dominion Hope, Mountaineer and Equitable were under rate moratoria in the past, all of those rate moratoria expired at the end of 2008. Prevailing market conditions at the time as those moratoria expired resulted in significant increases in rates for all of these utilities. The fall of 2010 saw significant decreases in rates for all gas utilities because of much lower market prices compared to recent past years. In 2011, all gas utility rates fell again except for Hope, which experienced large under-recoveries of revenue during the 2010-2011 heating season. That under recovery is included in the current heating season’s rates.

The shifting of deliveries from tariff sales to "transport-only" has continued in the industrial market, contracted somewhat for the commercial market, and with available "pooling," choices may spread to the residential market. Thus, major industrial expansion may tend to increase utility transport volumes rather than utility tariff sales volumes.

In the near-term, many customers are switching back and forth between tariff purchases and transportation depending on day-to-day or monthly overall costs and availability of gas and/or pipeline capacity.

TABLE NO. 1

COMPANY PROJECTIONS
MOUNTAINEER GAS COMPANY
2012 to 2021

TARIFF SALES (MMcf)

YEAR	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	WHOLESALE	TOTAL TARIFF SALES
2012	14,028	7,606	75	293	22,002
2013	13,958	7,568	75	292	21,893
2014	13,888	7,530	74	290	21,782
2015	13,819	7,492	74	289	21,674
2016	13,750	7,455	74	287	21,566
2017	13,681	7,418	73	286	21,458
2018	13,612	7,381	73	284	21,350
2019	13,544	7,344	72	283	21,243
2020	13,477	7,307	72	281	21,137
2021	13,409	7,270	72	280	21,031
AGR12-21	-0.5%	-0.5%	-0.5%	-0.5%	-0.5%

TRANSPORTED GAS (MMcf)

YEAR	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	SPECIAL CONTRACTS**	WHOLESALE	TOTAL TRANSPORTS
2012	1	10,686	8,265	0	0	18,952
2013	1	10,686	8,265	0	0	18,952
2014	1	10,686	8,265	0	0	18,952
2015	1	10,686	8,265	0	0	18,952
2016	1	10,686	8,265	0	0	18,952
2017	1	10,686	8,265	0	0	18,952
2018	1	10,686	8,265	0	0	18,952
2019	1	10,686	8,265	0	0	18,952
2020	1	10,686	8,265	0	0	18,952
2021	1	10,686	8,265	0	0	18,952
AGR12-21	0.0%	0.0%	0.0%	0.0%		0.0%

Mountaineer's estimate of unaccounted for gas is 4.0% of system inputs.

**Special Contract volumes have been included in the Industrial Transport Column

TABLE NO. 2

COMPANY PROJECTIONS
DOMINION HOPE GAS
2012 to 2021

TARIFF SALES (MMcf)

YEAR	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	WHOLESALE	TOTAL TARIFF SALES
2012	7,904	3,282	233	448	11,867
2013	7,874	3,282	233	448	11,837
2014	7,859	3,286	233	448	11,826
2015	7,852	3,291	233	448	11,824
2016	7,858	3,304	233	448	11,843
2017	7,871	3,312	233	448	11,864
2018	7,890	3,322	233	448	11,893
2019	7,988	3,325	233	448	11,994
2020	8,029	3,329	233	448	12,039
2021	8,032	3,333	233	448	12,046
AGR12-21	0.2%	0.2%	0.0%	0.0%	0.2%

TRANSPORTED GAS (MMcf)

YEAR	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	WHOLESALE	TOTAL TRANSPORTS
2012	0	686	6,591	0	7,277
2013	0	683	6,591	0	7,274
2014	0	683	6,591	0	7,274
2015	0	683	6,591	0	7,274
2016	0	683	6,591	0	7,274
2017	0	683	6,591	0	7,274
2018	0	683	6,570	0	7,253
2019	0	683	6,591	0	7,274
2020	0	683	6,591	0	7,274
2021	0	683	6,591	0	7,274
AGR12-21	0.0%	0.0%	0.0%	0.0%	0.0%

Hope's estimate of unaccounted for gas is 7.2% of total system inputs.

TABLE NO. 3

COMPANY PROJECTIONS
EQUITABLE GAS COMPANY
2012 to 2021

TARIFF SALES (MMcf)

YEAR	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	WHOLESALE	TOTAL TARIFF SALES
2012	1,036	736	84	0	1,857
2013	1,036	736	84	0	1,857
2014	1,036	736	84	0	1,857
2015	1,036	736	84	0	1,857
2016	1,036	736	84	0	1,857
2017	1,036	736	48	0	1,857
2018	1,036	736	84	0	1,857
2019	1,036	736	84	0	1,857
2020	1,036	736	84	0	1,857
2021	1,036	736	84	0	1,857
AGR12-21	0.0%	0.0%	0.0%	0.0%	0.0%

TRANSPORTED GAS (MMcf)

YEAR	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	SPECIAL CONTRACTS	WHOLESALE	TOTAL TRANSPORTS
2012	0	58	968	0	0	1,026
2013	0	58	968	0	0	1,026
2014	0	58	968	0	0	1,026
2015	0	58	968	0	0	1,026
2016	0	58	968	0	0	1,026
2017	0	58	968	0	0	1,026
2018	0	58	968	0	0	1,026
2019	0	58	968	0	0	1,026
2020	0	58	968	0	0	1,026
2021	0	58	968	0	0	1,026
AGR12-21	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Equitable's unaccounted for gas is reported as 4.7%.

TABLE NO. 4

TOTAL COMPANIES' PROJECTIONS

TOTAL GAS THROUGHPUT

2012 to 2021

YEAR	MOUNTAINEER GAS COMPANY	HOPE GAS	EQUITABLE GAS COMPANY	TOTAL SALES*	TOTAL TRANSPORT DEMANDS	TOTAL WV THROUGHPUT**
	MMcf	MMcf	MMcf	MMcf	MMcf	MMcf
2012	40,954	19,144	2,883	62,981	27,255	90,236
2013	40,844	19,111	2,883	62,838	27,252	90,090
2014	40,735	19,100	2,883	62,718	27,252	89,970
2015	40,626	19,098	2,883	62,607	27,252	89,859
2016	40,517	19,116	2,883	62,516	27,252	89,768
2017	40,409	19,138	2,883	62,430	27,252	89,682
2018	40,302	19,145	2,883	62,330	27,231	89,561
2019	40,195	19,268	2,883	62,346	27,252	89,598
2020	40,089	19,313	2,883	62,285	27,252	89,537
2021	39,983	19,319	2,883	62,185	27,252	89,437
AGR 12-21	-0.3%	0.1%	0.0%	-0.1%	0.0%	-0.1%

* Total Sales are scaled upward by 1.10 to represent sales to West Virginia gas customers that are made by distributors other than these three major companies.

** Includes total throughput, i.e., includes both commodity tariff sales and transportation volumes.

Supply Analysis

The volume of natural gas available for supply to the market depends upon the quantity of recoverable resources and the incentives for producing from that resource base. The natural gas market in the United States, once constrained as a multitude of local and regional markets, has become a national and continental market, and international when liquified natural gas (LNG) is considered. Therefore, it is not practicable for the Commission to perform the same detailed analysis of the supply side of this market as was done for the demand side.

Historically, the natural gas industry has been characterized by shortage-surplus-shortage cycles; however, much of this historical cycle was the result of effective price controls, such that the market response to changing circumstances was through quantity supplied rather than price.

The Potential Gas Committee[2], in its December 2010 report, estimated that the total potential resource of natural gas in the United States is 1,898 trillion cubic feet (Tcf), an increase of 62 Tcf from the Committee's 2008 report (reports are issued biannually), for an approximate 94-year supply at todays demand level. This represents an additional increase over the unprecedented increase reported in 2008. Previous years' reports noted a decrease in the potential reserves estimates between 2002 and 2004. The current estimate again includes Alaskan sources and estimated recoverable coalbed methane. The Potential Gas Committee's estimates also include the volume of proven recoverable natural gas reserves contained in the nation's discovered fields. Also, these resource base estimates do not include other reachable supply sources, such as Canadian gas or Mexican gas or LNG from overseas. More information may be obtained from the Committee's website at www.potentialgas.org. A short summary of the report and additional information is attached (Attachment A).

The Annual Energy Outlook 2011 of the Energy Information Administration on natural gas reserves and supply and demand estimates presents several different scenarios. All scenarios, however, indicate there will be an ample resource base during the 2012-2021 forecast period. The Outlook provides its analysis through 2035.

There have been, in recent years, concerns voiced in the gas industry over an expected (by some participants) supply shortfall at the national level within the next ten years. This projection is subject to many assumptions regarding economic activity, exploration and development efforts, gas-fired electric generation growth, overall national energy policies and legislation, etc. As of this report, however, such concern is no longer valid for reasons discussed below and in the aforementioned

[2]The Potential Gas Committee is an organization comprised of personnel from all parts of the natural gas industry. The Committee report can be obtained from the Potential Gas Agency, Colorado School of Mines.

reports. Additionally, the focus of this report is on the supply and demand status in West Virginia only. It should be noted that the State is, and has been for many decades, a net exporter of natural gas and currently exports approximately 80% of its production to other states.

Increased competition in the natural gas market has occurred as a result of efforts by producers and pipelines to sell excess supplies of gas and through the reduction of regulatory restrictions. The efforts by producers and pipelines have included special marketing programs, renegotiated contracts, and the development of a spot and futures market for natural gas. Competition was further enhanced by FERC Order 636. That Order was intended to further increase the availability of non-discriminatory transportation by interstate pipelines. A major result has been the broadening of the natural gas market such that customers and suppliers in different geographical regions can negotiate directly and move gas as needed through transportation services provided by pipelines. The impact in West Virginia can easily be seen by examining the shift of industrial and commercial tariff sales to transportation only for two of the three major companies considered in this report.

FERC Order 636 also sought to eliminate any advantage pipelines may have had in performing a "merchant" function for local distribution utilities. The intent was to increase competition on the supply side of the natural gas market.

The following is a brief review of the sources of supply for the Companies studied in this report.

Mountaineer has historically purchased approximately 70%-90% of its supply from the Southwest market with the balance purchased from Appalachian producers. Mountaineer is increasing its efforts to purchase additional local production. In recent years many Appalachian producers have opted to market their production to end-users on Mountaineer’s system.

The forecast supply for Dominion Hope indicates that its sources of supply include local purchases, Dominion Transmission Corporation, long-term contracts, and spot market purchases from the Appalachian and Southwest markets. Transportation to Dominion Hope's market will be provided by Dominion Transmission, Texas Gas Transmission and Columbia Gas Transmission. In all forecast years, it is believed that Dominion Hope will have an adequate supply of natural gas.

Equitable indicates its primary source of supply during the 2012-2021 forecast period will be approximately: 20% from the storage withdrawals/injections (the injection supply consists of gas purchases made during the injection season); 54% direct purchases of Appalachian natural gas; and 26% transported natural gas on the

Equitrans system. All of Equitable's purchased gas supplies come from direct feed Appalachian production.

As discussed earlier in the gas supply arrangements of the distribution utilities, the distributor relies heavily on the transmission supplier, and the transmission supplier relies on the upstream gas producer. Because of this arrangement, an exact supply number is an unnecessary oversimplification of the multi-tiered total gas acquisition process. West Virginia exports far more of its own locally-produced gas than is necessary to meet in-state demand.

Of highly significant importance is the current flurry of activity with regard to previously known, but technically inaccessible, gas formations in Appalachia, including much of West Virginia, known as the Marcellus and Utica Shale formations. Production from these formations requires horizontal drilling and extensive fracturing. Because of the cost of development, the Marcellus Shale until recently were of little practical interest. However, in the past few years, there has been keen interest shown by producers in acquiring leases with the intent to drill to and produce from these formations. Current speculation in industry circles is that the Marcellus Shale gas is the largest discovery ever, not only in West Virginia, but in the Appalachian region. It appears, judging from the current drilling boom in the northern half of the State, that the geologists and others are correct, this will obviously greatly strengthen West Virginia's position as a gas producer and would further support statements made above as to the supply and demand balance in the State.

One concern regarding supply should be noted. As production capital and operating and maintenance funds are shifted to the new shale production, there is speculation and some evidence that new conventional wells will not be drilled in non-shale areas of the State and existing low volume production will be neglected. This may result in localized shortages of supply where the utilities rely on local production to serve isolated pockets of customers and no other supply sources are available.

Conclusions

This report has examined the three major gas utilities responsible for 90% of total West Virginia throughput. As seen earlier in reviewing Table 4, the aggregate forecasts of the companies imply level to slightly decreasing total demand for natural gas in the State of West Virginia. The growth rate implied by the aggregate companies' forecast is negative 0.1%. Available supplies of natural gas are expected to be more than adequate to meet forecasted demands for 2012-2021. A number of factors are likely to keep this market in disequilibrium, including:

1. The effects of fully implemented FERC Order 636 and the Energy Policy Act of 1992 will continue to have an uncertain net impact on supply and demand;

2. Increasing environmental regulations affecting coal-fired electric generation will also increase natural gas demand. EPA rules have placed more stringent limits on nitrous oxide emissions. Further, the United States is discussing international concerns which could lead to increased limitations on carbon dioxide emissions;

3. Efforts to "restructure" the electric power market toward a more competitive market will mean increased end-use competition and increased sales of gas used for electric power generation;

4. Natural gas prices are in part affected by oil prices, and there are continuing attempts by oil producing nations to set production quotas sufficient to raise oil prices which would result in increased gas demand and prices;

5. Further expansion of programs which allow increased natural gas customer choice is being contemplated. This includes pooling of customers by marketers which may eventually enable residential gas customers to shift from tariff sales to transport-only on the State's gas utility systems;

6. Relatively high natural gas prices and supply uncertainties from l975 to l985 induced customers to make decisions and investments such as installing insulation, conversion to electric heat pumps and so forth which will continue to affect their demand for natural gas even if prices decrease;

7. Over the past several years, natural gas utilities experienced sharply higher supply prices for natural gas. As these supply price increases were passed on to utility customers, there was a downward pressure on consumption. As of this writing, however, prices are relatively low, at least in part due to the current over-supply created by the addition of new shale gas supplies; and,

8. There is some concern regarding adequate supplies to isolated pockets of utility customers due to the shift of attention to the shale production fields.

Appendix A

Other Information Available

Federal Government:

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

Energy Information Administration (EIA) www.eia.doe.gov

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

Attachment A

Potential Gas Committee

For Release April 27, 2011, 1100 EDT

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POTENTIAL GAS COMMITTEE REPORTS SUBSTANTIAL INCREASE IN MAGNITUDE OF U.S. NATURAL GAS RESOURCE BASE

GOLDEN, COLORADO — The Potential Gas Committee (PGC) today released the results of its latest biennial assessment of the nation's natural gas resources, which indicates that the United States possesses a total resource base of 1,898 trillion cubic feet (Tcf) as of year-end 2010. This is the highest resource evaluation in the Committee's 46-year history, exceeding the previous record-high assessment by 61 Tcf. Most of the increase arose from reevaluation of shale-gas plays in the Gulf Coast, Mid-Continent and Rocky Mountain areas.

These changes have been assessed in addition to the 44 Tcf of domestic marketed-gas production recorded during the two-year period since the Committee's previous report.

"The PGC's year-end 2010 assessment reaffirms the Committee's conviction that abundant, recoverable natural gas resources exist within our borders, both onshore and offshore, and in all types of reservoirs—from conventional, 'tight' and shales, to coals," said Dr. John B. Curtis, Professor of Geology and Geological Engineering at the Colorado School of Mines and Director of the Potential Gas Agency there, which provides guidance and technical assistance to the Potential Gas Committee.

Dr. Curtis cautioned, however, that the current assessment assumes neither a time schedule nor a specific market price for the discovery and production of future gas supply. "Assessments of the Potential Gas Committee are 'base-line estimates' in that they attempt to provide a reasonable appraisal of what we consider to be the 'technically recoverable' gas resource potential of the United States," he explained.

The Committee's year-end 2010 assessment of 1,898 Tcf (statistically aggregated mean value, rounded) includes 1,739 Tcf of gas attributable to "traditional" reservoirs (conventional, tight sands and carbonates, and shales) and 159 Tcf in coalbed reservoirs. Compared to year-end 2008, traditional resources increased by nearly 67 Tcf (4%), while coalbed gas resources declined by 4 Tcf (2.7%), resulting in a net increase in total potential resources of 61.4 Tcf (3.3%). (See accompanying Table 1.)

When the PGC's results are combined with the U.S. Department of Energy's latest available determination of proved dry-gas reserves, 273 Tcf as of year-end 2009, the United States has a total available *future supply* of 2,170 Tcf, an increase of 89 Tcf over the previous evaluation.

As Dr. Curtis observed, "Our knowledge of the geological endowment of technically recoverable gas continues to improve with each assessment. Furthermore, new and advanced exploration, well drilling, completion and stimulation technologies are allowing us increasingly better access to domestic gas resources—especially 'unconventional' gas—which, not all that long ago, were considered impractical or uneconomical to pursue."

"Consequently, our present assessment, strengthened by robust domestic production levels and a growing base of proved reserves, demonstrates an exceptionally strong and optimistic gas supply picture for the nation."

Overall, the Gulf Coast, including the Gulf of Mexico outer continental shelf, slope and deepwater, remains the country's richest resource area (29 percent of total traditional resources), followed by the Atlantic, Rocky Mountain and Mid-Continent areas, which altogether account for 85% of the assessed total traditional resource. (See accompanying Table 2.) Changes in the assessments from 2008 to 2010 arose primarily from analyses of new geological, drilling, well-test and production data from these same four regions. The largest volumetric and/or percentage increases in individual resource categories (Probable, Possible and Speculative) resulted mainly from reassessments of active and newly developing shale-gas plays in the Gulf Coast Area (La.-Miss.-Ala. Salt Basins, East Texas and Texas Gulf Coast Basins), as well as the Anadarko Basin (Mid-Continent Area), Piceance Basin (Rocky Mountain Area), Appalachian Basin (Atlantic Area) and Michigan Basin (North Central Area).

The growing importance of shale gas is substantiated by the fact that, of the 1,898 Tcf of total potential resources, shale gas accounts for 687 Tcf ("most likely" value), or

approximately 36%. PGC has again prepared a separate tabulation of shale-gas resources but has not computed an aggregated mean value inasmuch as shale gas is considered part of PGC's traditional resources.

Again this year, PGC is releasing an *Advance Summary* of its assessment results. This concise document will provide those who preorder the Committee's full-content printed report with all of the national, area- and province-level assessment tabulations and accompanying graphics for immediate analysis and critique.

PGC's complete printed report will include detailed area- and province-level resource assessments, summaries of recent E&P activities, and updated editions of its popular value-added features:

- *PGC and the Ultimately Recoverable Resource*—explains in simplified terms, with annotated graphics, the time-dynamic nature of gas resource assessment, the relationship between proved reserves and the PGC's categories of resources, and how these quantities lead to determination of the ultimately recoverable gas resource.
- *Historical Trends I*—Analyses of annual trends in U.S. crude oil, natural gas and gas liquids production for 1980-2010, together with the basics of 'vintaged' production graphs, production profiles, well and rig statistics, prices, revenues and other useful parameters, as well as forecasts of production trends to 2035. Accompanying detailed text describes each plotted trend, which is keyed to a graphical folio for the U.S. containing more than 90 charts that are rarely, if at all, seen in print elsewhere.
- *Historical Trends II*—Monthly gas production and well-count histories for all Lower 48 States' onshore and offshore provinces, allowing the reader to compare and contrast basins with rising, falling or stable production trends.
- *Historical Trends III*—Gas-well permitting and spudding histories for all producing provinces, a measure of overall health of the industry from basin to basin.
- *Historical Trends IV*—"Top-ten" rankings of gas producers and well production trends and performance, arranged by PGC province.
- *North American Perspectives I-II*—Overviews of natural gas resources, production and recent E&P activities in Canada and Mexico.
- *Frontier Gas Resources I-III*—Latest domestic and international developments in natural gas hydrates and liquefied natural gas (LNG); and U.S. shale gas resources and play characteristics.
- *From Reservoir to Burner Tip*—PGC's natural gas "primer," a less technical discussion of how and where natural gas occurs and how it is produced, stored, transported, delivered to and beneficially used by consumers.

In addition to the Advance Summary and complete printed report, the PGC will release the fifth edition of its information-packed DVD product, *PGC Trove 2011*. This disc will include digital versions of the report, both in its entirety and as amply bookmarked individual chapters. The trove will again feature the comprehensive *Folio of Historical Production Trends and Forecast for the United States*, consisting of more than 3,400 historical-trend plots covering separately the entire U.S. and Lower 48 States, as well as each petroleum-producing region and each onshore and offshore producing province.

With these offerings, the Potential Gas Committee presents a more complete picture of present gas supply and productive capacity of the North American natural gas industry than it has compiled previously.

Details of the Potential Gas Committee's Natural Gas Resource Assessment

(As of December 31, 2010)

The Potential Gas Committee (PGC) reports its gas resource assessments biennially in three categories of decreasing geological certainty—*Probable, Possible* and *Speculative*. For each, a *minimum, most likely* and *maximum* volume is assessed in each of 90 provinces in the Lower 48 States and Alaska. The *mean* values shown in Table 1 below were calculated by statistical aggregation of the minimum, most likely and maximum value ranges for each category. Mean values for total traditional resources and total coalbed gas resources are aggregated separately. This procedure imparts greater statistical validity to the results and allows for more direct comparison of PGC's assessments with those made by other organizations.

The PGC's assessments are not static. Each year, based on new exploration results, drilling and production information and various other data that become available, PGC members may reclassify resources at the province level from one category to another and to proved reserves.

Table 1

Resource Category	Mean Values, Tcf 2010	2008	Change Tcf (%)
Traditional Gas Resources:			
Probable resources (current fields)	536.6	441.4	
Possible resources (new fields)	687.7	736.9	
Speculative resources (frontiers)	518.3	500.7	
Total Traditional Gas Resources*	1,739.2	1,673.4	+66.7 (3.9%)
Coalbed Gas Resources:			
Probable resources	13.4	14.2	
Possible resources	48.1	49.8	
Speculative resources	96.2	98.9	
Total Coalbed Gas Resources*	158.6	163.0	–4.4 (–2.7%)
Grand Total Potential Resources**	**1,897.8**	**1,836.4**	+61.4 (3.3%)
Proved dry-gas reserves (DOE/EIA)	272.5†	244.7	
U.S. Future Gas Supply	**2,170.3**	**2,081.1**	+89.2 (4.3%)

* Mean values for Probable, Possible and Speculative resources are *not* arithmetically additive in deriving Total Traditional Gas Resources or Total Coalbed Gas Resources.

** Mean values for Total Traditional Resources and Total Coalbed Gas Resources are arithmetically additive in deriving Grand Total Potential Resources.

† Latest available figure is for year-end 2009.

Note: Totals are subject to rounding and differences due to statistical aggregation of distributions.

PGC's 90 geological provinces are grouped into seven geographic assessment areas. In similar fashion as above, the minimum, most likely and maximum value ranges for each category of traditional resources in each province within an area are aggregated at the area level to yield mean values for area Probable, Possible and Speculative traditional resources and a separately aggregated area total. Coalbed gas resources are aggregated only at the national level. Table 2 below compares the total mean values for these areas for year-end 2010 and year-end 2008.

Table 2

Assessment Area	Total Mean Values, Tcf 2010	2008	Change Tcf (%)
Traditional Gas Resources:			
Gulf Coast (including Gulf of Mexico)	506.0	455.2	+50.8 (11.2%)
Atlantic	353.6	353.5	+0.1 (0%)
Rocky Mountain	344.0	374.4	–30.4 (–8.1%)
Mid-Continent	272.2	274.9	–2.6 (–1.0%)
Alaska	193.8	193.8	0 (0%)
Pacific	54.0	51.3	+2.7 (5.3%)
North Central	21.6	24.0	–2.4 (–10%)
Total U.S. Traditional Gas Resources*	1,739.2	1,673.4	+65.7 (3.9%)
Coalbed Gas Resources (all areas)	158.6	163.0	–4.4 (–2.7%)
Grand Total Potential Resources**	**1,897.8**	**1,836.4**	+61.4 (3.3%)
Proved dry-gas reserves (DOE/EIA)	272.5†	244.7	
U.S. Future Gas Supply	**2,170.3**	**2,081.1**	+89.2 (4.3%)

* Mean values of Traditional Resources for the seven areas are *not* arithmetically additive in deriving Total U.S. Traditional Resources.

** Mean values for Total U.S. Traditional Gas Resources and Coalbed Gas Resources are arithmetically additive in deriving Grand Total Potential Resources.

† Latest available figure is for year-end 2009.

Note: Totals are subject to rounding and differences due to statistical aggregation of distributions.

How to Obtain the Potential Gas Committee 2010 Advance Summary and Report

Prepublication orders for the full-content printed PGC report, *Potential Supply of Natural Gas in the United States (December 31, 2010)* may now be placed with the Potential Gas Agency, Colorado School of Mines, Golden, CO 80401-1887. The cost of the printed report is US$495 (US$515 for foreign shipment), if payment accompanies the order. The printed report with the companion DVD will be available for US$950 (US$970 for foreign shipment). All purchasers will receive the *Advance Summary* immediately and will automatically be sent the full report (or report plus DVD) when the book is published later in 2011.

For additional information about ordering these and previous reports and DVDs, please contact Linda D'Epagnier, Program Assistant, at the Potential Gas Agency, telephone 303-273-3886, fax 303-273-3574, or e-mail: ldepagni@mines.edu.

About the Potential Gas Committee

The Potential Gas Committee, an incorporated, nonprofit organization, consists of knowledgeable and highly experienced volunteer members who work in the natural gas exploration, production and transportation industries and in the field and technical services and consulting sectors. The Committee also benefits from the input of respected technical advisors and various observers from federal and state government agencies, academia, and industry and research organizations in both the United States and Canada. Although the PGC functions independently, the Potential Gas Agency at the Colorado School of Mines provides the Committee with guidance, technical assistance, training and administrative support, and assists in member recruitment and outreach. The Potential Gas Agency receives financial support from prominent E&P and gas pipeline companies and distributors.

Note to Editors:
Selected illustrations from the press conference slide presentation are available for print use. Contact the Potential Gas Agency and specify desired figure number(s) and preferred file format (e.g., tiff, jpg, eps). Alternatively, one may request all the illustrations in the slide presentation as a Microsoft® PowerPoint® file (ppt).

Slide 5. Potential Gas Committee's assessment of traditional gas resources of the United States, as of December 31, 2010 (mean values, Tcf). Data from Potential Gas Committee (2011).

Slide 6. Potential Gas Committee's assessment of coalbed gas resources of the United States, as of December 31, 2010 (mean values, Tcf). Data from Potential Gas Committee (2011).

Slide 7. Potential Gas Committee's assessment of potential gas resources of the United States, traditional and coalbed, 1990-2010 (mean values, Tcf). Data from Potential Gas Committee (2011).

Slide 9. Map of Potential Gas Committee's assessment areas, annotated with total traditional and coalbed gas resource values for year-end 2010 (mean values, Tcf). Data from Potential Gas Committee (2011).

Slide 10. Comparison of Potential Gas Committee's potential traditional gas resources for the United States, by area, onshore and offshore, including coalbed gas, year-end 2010 ("most likely" values, Bcf). Data from Potential Gas Committee (2011).