

Analysis of the Mountain Valley Pipeline Southgate Project

Authors:

Elizabeth A. Stanton, PhD
Eliandro Tavares

July 25, 2019

Prepared For
Appalachian Voices



Applied Economics Clinic
Economic and Policy Analysis of Energy, Environment and Equity

Executive summary

This Applied Economics Clinic report uses publicly available data and documents to examine the need for the MVP Southgate project (see Figure 1). Neither MVP LLC nor PSNC have demonstrated the need for the MVP Southgate project. In particular, this report demonstrates that:

- MVP LLC has not provided convincing evidence of a need for MVP Southgate.
- PSNC’s forecasts of gas demand are higher than other publicly available forecasts for the region.
- Lower gas demand forecasts eliminate or delay the need for additional supply capacity.
- Cost-effective supply- and demand-side alternatives exist to new pipeline infrastructure.

Figure 1: Proposed route of the MVP mainline and the MVP Southgate



Source: *Preserve the New River Valley*, Haw River Assembly.

Questionable assumptions used to support “need” for MVP Southgate

MVP LLC claims that its purpose in building the MVP Southgate project is to “meet the growing needs of gas users in the southeastern U.S.”. This review discovered scant evidence of an increase in gas demand



in the Southeast region. Alternative projections of growth in gas demand for the region predict 1.2 to 1.6 percent annual growth in the next 5 years, in comparison to PSNC's projection of 2.2 percent annual growth. Based on PSNC's forecasts of design-day demand requirement, in 10 years its peak demand requirements will have increased by almost 189,000 Dth/d. Alternate projections result in 99,000 to 134,000 Dth/d in 10 years.

PSNC future supply capacity would increase by 37 percent with MVP Southgate

PSNC has contracted for 300,000 Dth/d of capacity in MVP Southgate: 80 percent of the project's total proposed capacity. Adding this new capacity would raise PSNC's supply from 810,062 Dth/d, to 1,110,062 Dth/d in 2020-2021 (37 percent) compared to PSNC's own projections of an 11 percent increase in demand by 2025 and 24 percent increase by 2030. No evidence has been provided that PSNC has suffered from an unreliable supply of gas that would require access to another interstate pipeline.

If additional supply were needed, non-pipeline alternatives may be less expensive

PSNC's forecasted supply of gas is more than sufficient to accommodate the current-day gas demand of its customers. Future levels of gas demand are uncertain, raising important questions regarding the best use of ratepayer funds in ensuring uninterrupted gas supply. Depending on uncertain forecasts of customers' future demand for gas, additional supply resources in the MVP Southgate area may not be necessary. In the event that customer demand exceeds available supply, non-pipeline alternatives may be available at lower or equal cost to building new pipeline infrastructure that will lock in investment in gas supply for another 40 years.

1. Introduction

On November 6, 2018, Mountain Valley Pipeline, LLC (MVP LLC) filed an application for a Certificate of Public Convenience and Necessity and for Related Authorizations with the Federal Energy Regulatory Commission (FERC) to build and operate the Mountain Valley Pipeline Southgate (MVP Southgate) project. The MVP Southgate project is a 73-mile, 24-inch/16-inch diameter pipeline that would receive gas from the Mountain Valley Pipeline (MVP),¹ near the City of Chatham, Pittsylvania County, Virginia and deliver gas to Dominion Energy² near the City of Graham, Alamance County, North Carolina starting on November 1, 2020. Figure 2 shows the proposed route of the MVP Southgate project as of November 2018.

Figure 2: MVP Southgate proposed route, including existing Williams-Transco pipeline



Source: EIA, *Preserve the New River Valley, Haw River Assembly*.

¹ The MVP project is a fracked gas pipeline system that would cover about 300 miles from northwestern West Virginia to southern Virginia. The pipeline is currently under construction and is scheduled to start operations in the fourth quarter of 2019. Source: <https://www.mountainvalleypipeline.info/>

² On January 2, 2019, Dominion Energy, Inc. and SCANA Corporation, parent company of PSNC, announced that they completed their proposed merger. The press release is available at: <https://dominionenergy.mediaroom.com/2019-01-02-Dominion-Energy-Combines-With-SCANA-Corporation>. According to PSNC's website (<https://www.psnenergy.com/>) the new company name will be Dominion Energy.

The project also includes a compressor station (Lambert Compressor Station), meter stations, and ancillary facilities. The MVP Southgate project would deliver 375,000 dekatherms per day (Dth/d) of gas at an estimated construction cost of \$468 million and an annual cost of service of \$86 million.³

In December 2017, MVP LLC and PSNC Energy signed a binding long-term agreement for delivery of 300,000 Dth/d of gas on the MVP Southgate pipeline. According to MVP LLC filings with FERC, “Mountain Valley has been in discussion with additional potential shippers and anticipates that it will be able to execute agreements for additional capacity in the future.”⁴ Between April 11, 2018 and May 11, 2018, MVP LLC held a binding open season for transportation capacity on the MVP Southgate pipeline and found no interest in capacity purchases from other companies.⁵

This report uses publicly available data and documents to examine the need for the MVP Southgate project to meet future demand for gas. This analysis was conducted under the assumption that the Atlantic Coast Pipeline (ACP), a proposed pipeline that would run for 600 miles from West Virginia to North Carolina,⁶ will not be built.⁷ PSNC had contracted capacity for 100,000 Dth/d of gas supply on the ACP for a 20-year period.⁸

Section 2 compares recent trends in gas demand in North Carolina to publicly available design-day demand requirements forecasts for the region. Section 3 describes PSNC’s current and future supply capacity, explains the impact of adding the MVP Southgate to PSNC’s supply assets, and examines PSNC’s claims that the MVP Southgate project will improve gas supply reliability. Section 4 compares PSNC’s projected design-day demand requirements for gas with (1) PSNC’s current and future supply capabilities and (2) MVP Southgate projected supply of gas contracted by PSNC to assess the need for alternative resources to meet the future demand for gas.

Neither MVP LLC nor PSNC have demonstrated the need for the MVP Southgate project. In particular, this report demonstrates that:

- MVP LLC has not provided convincing evidence of a need for MVP Southgate.

³ Notice of Application; Mountain Valley Pipeline, LLC. Federal Register / Vol. 83, No. 227 / Monday, November 26, 2018 / Notices. Department of Energy, Federal Energy Regulatory Commission. FERC Docket No. CP19–14–000. PF18–4–000. Available at: <https://www.govinfo.gov/content/pkg/FR-2018-11-26/pdf/2018-25637.pdf> and Application of Mountain Valley Pipeline, LLC for Authorization to Construct and Operate Pipeline Facilities under the Natural Gas Act, p.2. Mountain Valley Pipeline, LLC. FERC Docket No. CP19–14–000. November 6, 2018. Available at: <http://www.mvpsouthgate.com/wp-content/uploads/2018/12/MVP-Southgate-Pipeline-Certificate-App-Vol-I-PUBLIC-11.6.18.pdf>

⁴ Application of Mountain Valley Pipeline, LLC for Authorization to Construct and Operate Pipeline Facilities under the Natural Gas Act, p.2. FERC Docket No. CP19–14–000. November 6, 2018. Available at: <http://www.mvpsouthgate.com/wp-content/uploads/2018/12/MVP-Southgate-Pipeline-Certificate-App-Vol-I-PUBLIC-11.6.18.pdf>

⁵ Application of Mountain Valley Pipeline, LLC for Authorization to Construct and Operate Pipeline Facilities under the Natural Gas Act. Mountain Valley Pipeline, LLC. Exhibit Z-2 – Open Season Notice. FERC Docket No. CP19–14–000. November 6, 2018. Available at: <http://www.mvpsouthgate.com/wp-content/uploads/2018/12/MVP-Southgate-Pipeline-Certificate-App-Vol-I-PUBLIC-11.6.18.pdf>

⁶ Atlantic Coast Pipeline website: <https://atlanticcoastpipeline.com/about/default.aspx>

⁷ As of May of 2019, work on the ACP project remains stopped.

⁸ Annual Review of Gas Costs. Public Service Company of North Carolina. Direct Testimony of Rose M. Jackson. NCUC Docket No. G-5, Sub 558. June 2015. Available at: <https://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=df60d9ca-aae5-473a-9598-b968a61b18cc>

- PSNC’s forecasts of gas demand are higher than other publicly available forecasts for the region.
- Lower gas demand forecasts eliminate or delay the need for additional supply capacity.
- Cost-effective supply- and demand-side alternatives exist to new pipeline infrastructure.

2. Future demand for gas

MVP LLC claims that the MVP Southgate capacity is necessary to meet growing demand. Since there is no evidence that MVP Southgate or PSNC will use the additional supply to provide gas to electric generators,⁹ this analysis focuses on gas demand for final use by residential, commercial, and industrial customers. PSNC’s demand forecasts are the highest among all publicly available forecasts for the region. This section examines MVP LLC claims that the MVP Southgate project is necessary, analyzes recent trends in gas demand in North Carolina, and compares publicly available design-day demand requirements forecasts for the region with PSNC’s most recent forecast.

MVP LLC is a Delaware limited liability company with headquarters in Pittsburgh, Pennsylvania.¹⁰ It was founded in 2014 as a joint venture between EQM Midstream Partners, LP; NextEra US Gas Assets, LLC; Con Edison Transmission, Inc.; WGL Midstream; and RGC Midstream, LLC.¹¹ In October 2017, the Federal Energy Regulatory Commission (FERC) approved MVP LLC’s application to build the MVP, which would run about 300 miles from West Virginia to Southern Virginia.¹² On November 6, 2018, MVP LLC filed an application with the FERC to build the MVP Southgate project.¹³

PSNC is a gas local distribution company serving in whole or in part 28 counties in North Carolina. PSNC has contracted to purchase 80 percent of the gas that would be supplied by MVP Southgate.¹⁴ Figure 3 below shows the service area (in blue) of PSNC in North Carolina.

⁹ MVP Southgate Project: Myth vs. Fact. Available at: <http://www.mvpsouthgate.com/wp-content/uploads/2018/11/MVP-Southgate-Myth-vs-FactOct2018.pdf>

¹⁰ Application of Mountain Valley Pipeline, LLC for Authorization to Construct and Operate Pipeline Facilities under the Natural Gas Act. Mountain Valley Pipeline, LLC. FERC Docket No. CP19–14–000. November 6, 2018. Available at: <http://www.mvpsouthgate.com/wp-content/uploads/2018/12/MVP-Southgate-Pipeline-Certificate-App-Vol-I-PUBLIC-11.6.18.pdf>

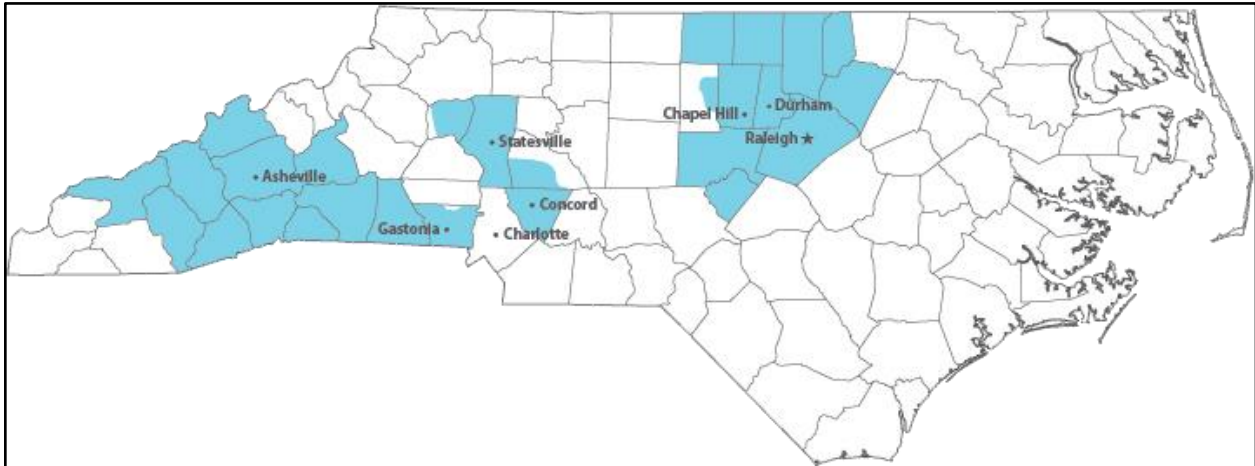
¹¹ MVP Project Website, Overview. Available at: <https://www.mountainvalleypipeline.info/overview>

¹² Order Issuing Certificates and Granting Abandonment Authority, Federal Energy Regulatory Commission. FERC Docket No. CP16-10-000. October 13, 2017. Available at: <https://www.ferc.gov/CalendarFiles/20171013192058-CP16-10-000.pdf>

¹³ Application of Mountain Valley Pipeline, LLC for Authorization to Construct and Operate Pipeline Facilities under the Natural Gas Act Mountain Valley Pipeline, LLC. FERC Docket No. CP19–14–000. November 6, 2018. Available at: <http://www.mvpsouthgate.com/wp-content/uploads/2018/12/MVP-Southgate-Pipeline-Certificate-App-Vol-I-PUBLIC-11.6.18.pdf>

¹⁴ PSNC contracted for 300,000 Dth/d, which corresponds to 80 percent of the proposed capacity of the MVP Southgate project of 375,000 Dth/d. See: Application of Mountain Valley Pipeline, LLC for Authorization to Construct and Operate Pipeline Facilities under the Natural Gas Act, p.2. Mountain Valley Pipeline, LLC. FERC Docket No. CP19–14–000. November 6, 2018. Available at: <http://www.mvpsouthgate.com/wp-content/uploads/2018/12/MVP-Southgate-Pipeline-Certificate-App-Vol-I-PUBLIC-11.6.18.pdf>

Figure 3: PSNC service area



Source: Reproduced from PSNC Energy Website, Service Area Map. Available at: <https://www.psnccenergy.com/about-us/service-area-map>

In 2017, PSNC served a little over 562,000 customers in North Carolina, or about 40 percent of the total number of gas customers in the state.¹⁵ Most of PSNC’s customers—92.0 percent—are residential. Only 7.9 percent of the company’s customers are commercial, and 0.1 percent are industrial.¹⁶ In 2017, PSNC delivered about 88 million Dth, about 16 percent of the gas sold and transported in North Carolina.¹⁷

In a document entitled “MVP Southgate Project: Myth vs. Fact,” MVP LLC explains that the MVP Southgate will not be used to provide gas for electricity generation:

PSNC Energy is a natural gas distributor, not an electricity generator. Natural gas has multiple uses, including home and business heating, cooking and manufacturing processes.¹⁸

In the analysis in this report, therefore, PSNC’s use of gas is assumed to be entirely for direct use, and no current or future PSNC gas demand for electric use is assumed.

MVP LLC claims MVP Southgate is needed to meet customer demand

In its application to FERC for authorization to construct and operate the MVP Southgate pipeline, MVP LLC states that its purpose in building the MVP Southgate project is to “meet the growing needs of gas

¹⁵ NCUC. 2018 NCUC Report - Volume XLIX. Major Activities through December 2018 with Statistical and Analytical Data through 2017. Figure NO. 5-9. Available at: <https://www.ncuc.net/statbook/2018report.pdf>

¹⁶ NCUC North Carolina’s Public Utility Infrastructure & Regulatory Climate. October 2018. Available at: <https://www.ncuc.net/documents/overview.pdf>

¹⁷ NCUC. 2018 NCUC Report - Volume XLIX. Major Activities through December 2018 with Statistical and Analytical Data through 2017. Available at: <https://www.ncuc.net/statbook/2018report.pdf>

¹⁸ MVP, LLC, MVP Southgate Project: Myth vs. Fact. October 2018. Available at: <http://www.mvpsouthgate.com/wp-content/uploads/2018/11/MVP-Southgate-Myth-vs-FactOct2018.pdf>

users in the southeastern U.S.”¹⁹ While MVP LLC does not provide a forecast of future gas demand for the specific area that the MVP Southgate project would cover, MVP LLC argues in its application to build the MVP Southgate that:

- (1) U.S. total gas demand, including gas for electric generation, “will increase from 27.6 trillion cubic feet (“Tcf”) in 2017 to 33.6 Tcf in 2040.”²⁰ MVP LLC expects that gas demand will increase at an average annual rate of 0.9 percent between 2017 and 2040;²¹
- (2) North Carolina’s gas demand has grown “from 304,148 MMcf in 2010 to 509,440 MMcf in 2017.”²² MVP LLC reports that gas demand in North Carolina has increased at an annual rate of 7.6 percent between 2010 and 2017;²³ and
- (3) Growth in gas demand in the Southeast region²⁴ is driven by population growth.²⁵

Upon examination, each of MVP LLC’s claims appears to be faulty (see Table 1):

MVP LLC Claim #1: U.S. gas demand will increase by 0.9 percent per year between 2017 and 2040: This rate of growth includes the expected demand increase of all the regions of the United States, each of which have their own unique needs for gas. In the South Atlantic region in which MVP Southgate would be located,²⁶ however, the U.S. Energy Information Administration (EIA) projects that gas demand will increase by only 0.2 percent per year during the same period.²⁷

¹⁹ Application of Mountain Valley Pipeline, LLC for Authorization to Construct and Operate Pipeline Facilities under the Natural Gas Act. Mountain Valley Pipeline, LLC. p.2. FERC Docket No. CP19–14–000. November 6, 2018. Available at: <http://www.mvpsouthgate.com/wp-content/uploads/2018/12/MVP-Southgate-Pipeline-Certificate-App-Vol-I-PUBLIC-11.6.18.pdf>

²⁰ Application of Mountain Valley Pipeline, LLC for Authorization to Construct and Operate Pipeline Facilities under the Natural Gas Act. Mountain Valley Pipeline, LLC. p.3. FERC Docket No. CP19–14–000. November 6, 2018. Available at: <http://www.mvpsouthgate.com/wp-content/uploads/2018/12/MVP-Southgate-Pipeline-Certificate-App-Vol-I-PUBLIC-11.6.18.pdf>

²¹ The data used by MPC LLC come from EIA. 2018 Annual Energy Outlook. Energy consumption. <https://www.eia.gov/outlooks/aeo/data/browser/#/?id=2-AEO2018®ion=1-0&cases=ref2018&start=2016&end=2050&f=A&linechart=ref2018-d121317a.3-2-AEO2018.1-0&map=ref2018-d121317a.4-2-AEO2018.1-0&sourcekey=0>

²² Application of Mountain Valley Pipeline, LLC for Authorization to Construct and Operate Pipeline Facilities under the Natural Gas Act. Mountain Valley Pipeline, LLC. p.3, FERC Docket No. CP19–14–000. November 6, 2018. Available at: <http://www.mvpsouthgate.com/wp-content/uploads/2018/12/MVP-Southgate-Pipeline-Certificate-App-Vol-I-PUBLIC-11.6.18.pdf>

²³ The data used by MVP LLC come from EIA. North Carolina Natural Gas Consumption by End Use. Available at: https://www.eia.gov/dnav/ng/ng_cons_sum_dcu_snc_a.htm

²⁴ MVP LLC defines the Southeast region as: Alabama, Florida, Georgia, North Carolina, South Carolina, Tennessee, Virginia and West Virginia.

²⁵ Application of Mountain Valley Pipeline, LLC for Authorization to Construct and Operate Pipeline Facilities under the Natural Gas Act. Mountain Valley Pipeline, LLC. p.3. FERC Docket No. CP19–14–000. November 6, 2018. Available at: <http://www.mvpsouthgate.com/wp-content/uploads/2018/12/MVP-Southgate-Pipeline-Certificate-App-Vol-I-PUBLIC-11.6.18.pdf>

²⁶ The EIA’s South Atlantic region includes Delaware, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia and the District of Columbia.

²⁷ EIA, AEO 2019, Reference Case. Available at: <https://www.eia.gov/outlooks/aeo/data/browser/#/?id=2-AEO2019®ion=1-5&cases=ref2019&start=2017&end=2050&f=A&linechart=ref2019-d111618a.3-2-AEO2019.1-5&map=ref2019-d111618a.5-2-AEO2019.1-5&sourcekey=0>



MVP LLC Claim #2: Gas demand in North Carolina has increased at an annual rate of 7.6 percent between 2010 and 2017: This rate of growth includes the increase in consumption of gas both for direct use and for electric generation, whereas MVP Southgate will not be used to deliver gas for electric customers. North Carolina’s direct gas consumption by residential, commercial, and industrial customers fell by an annual rate of 0.1 percent between 2010 and 2017.²⁸

MVP LLC Claim #3: Increasing gas demand in the Southeast region is driven by population growth: MVP LLC cites a study it commissioned from Wood Mackenzie showing that the usage of gas by local gas distribution companies and other non-electric generation customers in the Southeast region will increase at a rate of 1.6 percent per year from 2015 to 2030.²⁹ MVP LLC claims that this rate of growth is due in large part to its claimed expected increase in population in North Carolina of almost 2 million people between 2020 and 2035.³⁰ According to the North Carolina Office of State Budget and Management,³¹ North Carolina’s population is projected to increase by only 1.8 million people between 2020 and 2035 at an annual growth rate of 1.0 percent.

MVP LLC presents no evidence of increased use *per customer* and historical data show that total direct use actually *decreased* between 2010 and 2017. This leaves open not only the question of why MVP LLC’s population growth figure should be accepted rather than that of the State, but also why—especially given advances in energy efficiency—MVP LLC expects an increase in usage per customer.

²⁸ EIA. North Carolina Natural Gas Consumption by End Use. Available at:

https://www.eia.gov/dnav/ng/ng_cons_sum_dcu_snc_a.htm

²⁹ Wood Mackenzie, Inc. Southeast U.S. Natural Gas Market Demand in Support of the Mountain Valley Pipeline Project. January 2016. FERC Docket No. CP16-10-000, in: Motion to Answer and Answer of Mountain Valley Pipeline, LLC to Comments on the Draft Environmental Impact Statement. Exhibit A. Available at:

<https://www.mountainvalleypipeline.info/~media/Sites/MVP/News-Info/Files/1/MVP%20Answer%20to%20Comments%20on%20DEIS.ashx>

³⁰ Application of Mountain Valley Pipeline, LLC for Authorization to Construct and Operate Pipeline Facilities under the Natural Gas Act. Mountain Valley Pipeline, LLC. p.3. FERC Docket No. CP19-14-000. November 6, 2018. Available at: <http://www.mvpsouthgate.com/wp-content/uploads/2018/12/MVP-Southgate-Pipeline-Certificate-App-Vol-I-PUBLIC-11.6.18.pdf>

³¹ North Carolina Office of State Budget and Management, County/State Population Projections. Available at: <https://www.osbm.nc.gov/demog/county-projections>

Table 1: North Carolina gas and population growth, MVP LLC and corrections

MVP LLC Claims	AEC Fact Check
MVP claims: 7.6 percent historical (2010-2017) annual growth in North Carolina gas demand (<u>including</u> gas for electricity)	Fact check: -0.1 percent historical (2010-2017) annual growth in North Carolina gas demand (<u>excluding</u> gas for electricity)
MVP claims: 0.9 percent annual growth in future gas sales (2017-2040) based on all U.S. expected growth from EIA forecast	Fact check: 0.2 percent annual growth in future gas sales (2017-2040) for the <u>South Atlantic</u> region from EIA forecast
MVP claims: 1.6 percent annual growth in future gas use (2020-2035) for the <u>Southeast</u> , which MVP states is largely due to population growth	Fact check: <u>North Carolina's</u> population is only expected to grow 1.0 percent annually (2020-2035)

Sources: EIA. *North Carolina Natural Gas Consumption by End Use*. Available at: https://www.eia.gov/dnav/ng/ng_cons_sum_dcu_snc_a.htm. EIA, AEO 2019, Reference Case. Available at: <https://www.eia.gov/outlooks/aeo/data/browser/#/?id=2-AEO2019®ion=1-5&cases=ref2019&start=2017&end=2050&f=A&linechart=ref2019-d111618a.3-2-AEO2019.1-5&map=ref2019-d111618a.5-2-AEO2019.1-5&sourcekey=0>. North Carolina Office of State Budget and Management, *County/State Population Projections*. Available at: <https://www.osbm.nc.gov/demog/county-projections>. Note: South Atlantic region includes Delaware, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia, and the District of Columbia.

In summary, excluding gas consumption for electric generation, this review discovered scant evidence of an increase in gas demand in North Carolina. Even if population growth drives gas demand, as claimed by MVP LLC, the projected growth rate used by MVP LLC overestimates North Carolina’s expected population.

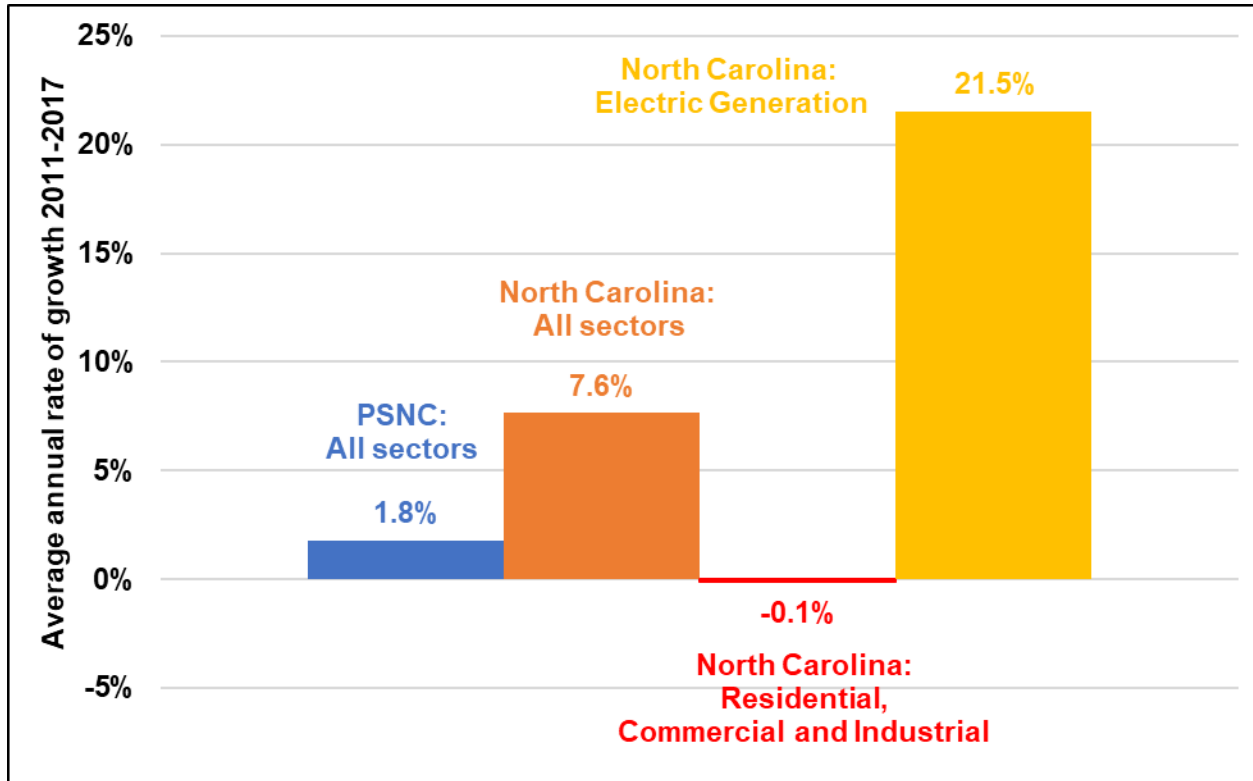
Historical data do not support MVP LLC’s expected growth in gas demand

Total sales of gas in North Carolina, including gas for electric generation, increased at an annual growth rate of 7.6 percent between 2010 and 2017. North Carolina’s growth in gas demand has been the result of sales of gas for electric generation, which grew 21.5 percent per year during this period (Figure 4).

The MVP Southgate project’s stated purpose—to “meet the growing needs of natural gas users in the southeastern U.S.”³²—does not appear to be consistent with actual expected gas demand for the region. The historical data presented in Figure 4 do not suggest a growing demand for gas for direct use by residential, commercial, and industrial customers.

³² Application of Mountain Valley Pipeline, LLC for Authorization to Construct and Operate Pipeline Facilities under the Natural Gas Act. Mountain Valley Pipeline, LLC. p.2. FERC Docket No. CP19–14–000. November 6, 2018. Available at: <http://www.mvpsouthgate.com/wp-content/uploads/2018/12/MVP-Southgate-Pipeline-Certificate-App-Vol-I-PUBLIC-11.6.18.pdf>

Figure 4: Average annual rate of growth in gas sales: PSNC and North Carolina (2011-2017)



Source data: PSNC: North Carolina Utilities Commission (NCUC). Quarterly Reports. Several years. Available at: <https://starw1.ncuc.net/NCUC/page/docket-docs/PSC/DocketDetails.aspx?DocketId=47a0cf55-9c8a-474c-8afb-95396343d5b5> and NCUC. 2018 NCUC Report - Volume XLIX. Major Activities through December 2018 with Statistical and Analytical Data through 2017. Available at: <https://www.ncuc.net/statbook/2018report.pdf>. North Carolina: EIA. Annual Energy Outlook 2019, Reference Case. Available at: https://www.eia.gov/dnav/ng/ng_cons_sum_dcu_snc_a.htm

PSNC has overestimated its expected growth in gas demand

PSNC has likely overestimated its expected growth in gas demand for the next five years.³³ PSNC's forecasts of future design-day demand requirements are the highest among all publicly available projections for the region. According to the North Carolina Office of State Budget and Management,³⁴ population in PSNC's service area is expected to increase at an average annual rate of 1.6 percent in the next five years, which is similar to the rate of growth of population of 1.5 percent in previous years, while PSNC expects its design-day demand to increase more rapidly than it has in the past.

³³ In its last review of gas costs, PSNC presented forecasts for its design-day requirements only for the next five years.

³⁴ North Carolina Office of State Budget and Management, County/State Population Projections. Available at: <https://www.osbm.nc.gov/demog/county-projections>



According to PSNC's last Annual Review of Gas Costs,³⁵ design-day demand is projected using a regression analysis prepared by SCANA (now Dominion, PSNC's parent company), assuming a 50 "heating degree day." (That is, PSNC expects that on its design day—the maximum peak day used for planning purposes—building temperatures will need to be raised to or maintained at 50 degrees to reach their target temperature of 60°F.)³⁶ Neither PSNC nor SCANA provide details on this statistical model to the public. Specifically, no publicly available information exists with respect to the econometric models employed, the regression analysis, assumptions, and the data used to forecast PSNC's demand for gas.

In the absence of this information, this report compares PSNC's forecasts with other forecasts of demand for the region. According to PSNC, its design-day demand will increase from 800,404 Dth/d in 2018-2019 to 872,173 Dth/d in 2022-2023—an annual rate of growth of PSNC's design-day demand of 2.2 percent.

Forecasts by Wilson et al. and Piedmont Natural Gas Company project slower annual growth for the region (see Figure 5) and do not support the utility's expectation of 2.2 percent annual growth over the next 5 years.

- **Wilson et al.:** In an analysis of the need for additional pipeline capacity into Virginia and the Carolinas, Wilson et al. projected winter peak non-electric demand for gas for the period 2015-2030 growing at 1.2 percent per year between 2015 and 2030.³⁷ This analysis used data from the most recent filings by 13 gas distribution companies located in Virginia, North Carolina, and South Carolina to determine the design-day requirements for each company. Wilson et al. used historical as well as 1- to 5-year forecasts of rates of growth for design-day requirements provided by the companies and used these growth rates to project peak demand through 2030.
- **Piedmont:** Piedmont Natural Gas Company is the largest local distribution company of gas in North Carolina in number of customers and volume of gas delivered. Piedmont explains that it forecasts its future number of consumers by reviewing historical consumer additions and using forecasts of variables such as economic conditions and demographics. To calculate its design-day demand requirements, Piedmont uses usage data and regression analysis to determine base load and the usage per heating degree.³⁸ For the period 2018-2019 to 2022-2023, Piedmont expects its design-day demand to increase at an annual rate of 1.6 percent.

³⁵ Annual Review of Gas Costs. Public Service Company of North Carolina. Direct Testimony of Rose M. Jackson, p.6 and Jackson Exhibit 2, p.1. NCUC Docket No. G-5, Sub 591. June 2018. Available at: <https://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=af619eee-4421-4f69-aa7f-af19a9a219c9>

³⁶ Heating degree days (HDDs) estimate the demand for energy needed to heat buildings. See: EnergyWatch. Heating and Cooling Degree Days: What are they and Why do they Matter? Available at: <https://energywatch-inc.com/heating-cooling-degree-days-explained/>

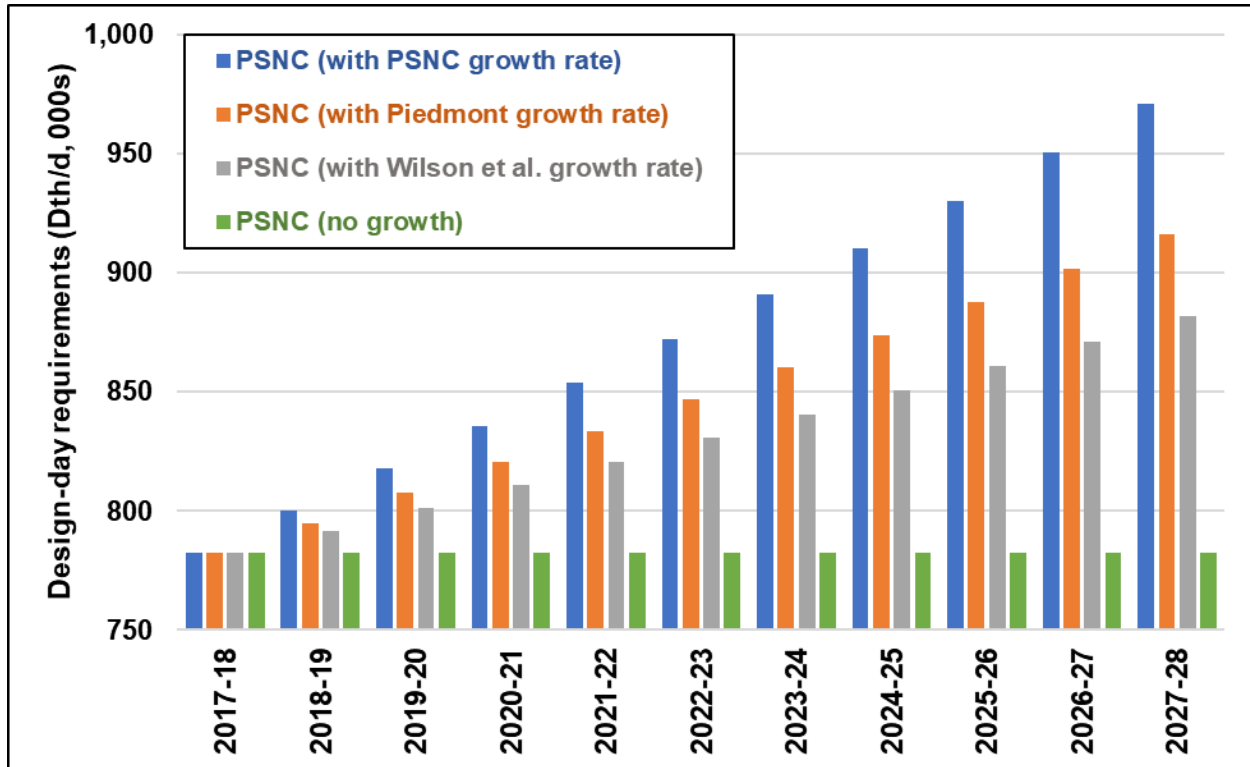
³⁷ Rachel Wilson et al. *Are the Atlantic Coast Pipeline and the Mountain Valley Pipeline Necessary? An examination of the need for additional pipeline capacity into Virginia and Carolinas.* Prepared for Southern Environmental Law Center and Appalachian Mountain Advocates. September 2016. Available at: https://www.southernenvironment.org/uploads/words_docs/2016_09_12_Synapse_Report_-_Are_the_ACP_and_MVP_Necessary_FINAL.PDF

³⁸ Annual Review of Gas Costs. Testimony and Exhibits of Gennifer Raney on behalf of Piedmont Natural Gas Company, Inc. NCUC Docket No. G-9, Sub 727. August 2018. Available at: <https://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=feb95b8f-afe1-4fab-8040-edd252c431a3>



Based on PSNC’s forecasts of design-day demand requirement, in 10 years its design-day demand requirements will have increased by almost 189,000 Dth/d. Using Piedmont’s rate of growth of 1.6 percent would result in a total increase of about 134,000 Dth/d in 10 years while Wilson et al.’s projected rate of growth of 1.2 percent would produce a total increase of only 99,000 Dth/d.

Figure 5: Forecasts of PSNC design-day requirements under different projected rates of growth



Source data: Annual Review of Gas Costs. Public Service Company of North Carolina, Direct Testimony of Rose M. Jackson, Jackson Exhibit 1. NCUC Docket No. G-5, Sub 591. June 2018. Available at: <https://starw1.ncuc.net/NCUC/ViewFile.aspx?id=af619eee-4421-4f69-aa7f-af19a9a219c9>. Annual Review of Gas Costs. Testimony and Exhibits of Gennifer Raney on behalf of Piedmont Natural Gas Company, Inc. NCUC Docket No. G-9, Sub 727. August 2018. Available at: <https://starw1.ncuc.net/NCUC/ViewFile.aspx?id=feb95b8f-afe1-4fab-8040-edd252c431a3>. Rachel Wilson et al. Are the Atlantic Coast Pipeline and the Mountain Valley Pipeline Necessary? An examination of the need for additional pipeline capacity into Virginia and Carolinas. Prepared for Southern Environmental Law Center and Appalachian Mountain Advocates. September 2016. Available at: https://www.southernenvironment.org/uploads/words_docs/2016_09_12_Synapse_Report_-_Are_the_ACP_and_MVP_Necessary_FINAL.PDF.

PSNC has not provided information on what variables are included in the regression analysis prepared by Dominion (PSNC’s parent company), making it impossible to identify the factors that drive the increase in the rate of growth of design-day demand requirements projected by the company. MVP LLC argues that a substantial increase in population in North Carolina will drive growth in future demand for

gas in the region. However, according to PSNC’s Annual Review of Gas Costs and data from the North Carolina Office of State Budget and Management:³⁹

- From 2011 to 2018, PSNC’s design-day requirements grew by 2.0 percent per year while population in the 28 counties served by PSNC grew by 1.6 percent per year.
- From 2019 to 2023, PSNC’s design-day requirements are expected to grow by 2.2 percent per year while population in the 28 counties served by PSNC is projected to grow by 1.5 percent per year.

The high rate of growth expected by PSNC for its design-day demand does not appear to be explained by an increase in the rate of population growth in the areas served by the Company.

3. Future supply of gas

PSNC gas capacity is growing. This section describes current and future supply capacity available to PSNC, including access to interstate pipelines and storage and peaking capacity, describes the effect of adding the MVP Southgate to PSNC’s supply assets, and examines PSNC’s claims that the MVP Southgate project will improve gas supply reliability and give pipeline access to gas from the Marcellus and Utica regions. (This analysis assumes that the ACP is not built.)

PSNC existing supply capacity provides 810,000 Dth/d

PSNC has three types of gas supply capabilities: (1) Gas transportation on interstate pipelines, (2) peaking capacity on PSNC’s liquefied gas facility, and (3) storage capacity on interstate pipelines.

1. **Pipeline:** Gas transportation on interstate pipelines is year-round supply capacity on interstate pipelines contracted by PSNC. Currently, PSNC has contracted capacity with Williams-Transcontinental Gas Pipeline Company, LLC (“Williams-Transco”) for 390,743 Dth/d and Dominion Energy Transmission, Inc. (“DETI”) for 7,331 Dth/d.⁴⁰
2. **LNG:** Peaking capacity on PSNC’s on-system liquefied gas (LNG) facility is supply capacity intended to meet peak demand. PSNC’s peaking capacity is 233,675 Dth/d.⁴¹
3. **Storage:** Storage capacity on interstate pipelines is seasonal supply capacity on interstate pipelines. Currently, PSNC has contracts with Williams-Transco, DETI, Columbia Gas

³⁹ PSNC Annual Review of Gas Costs are available at: <https://www.ncuc.net/>, while population data from the North Carolina Office of State Budget and Management are available at: <https://www.osbm.nc.gov/demog/county-projections>

⁴⁰ Annual Review of Gas Costs. Public Service Company of North Carolina. Direct Testimony of Rose M. Jackson. Revised Jackson Exhibit 1. NCUC Docket No. G-5, Sub 591. July 2018. Available at: <https://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=0093c4f3-3958-4e47-9747-b8395c29b8b6>

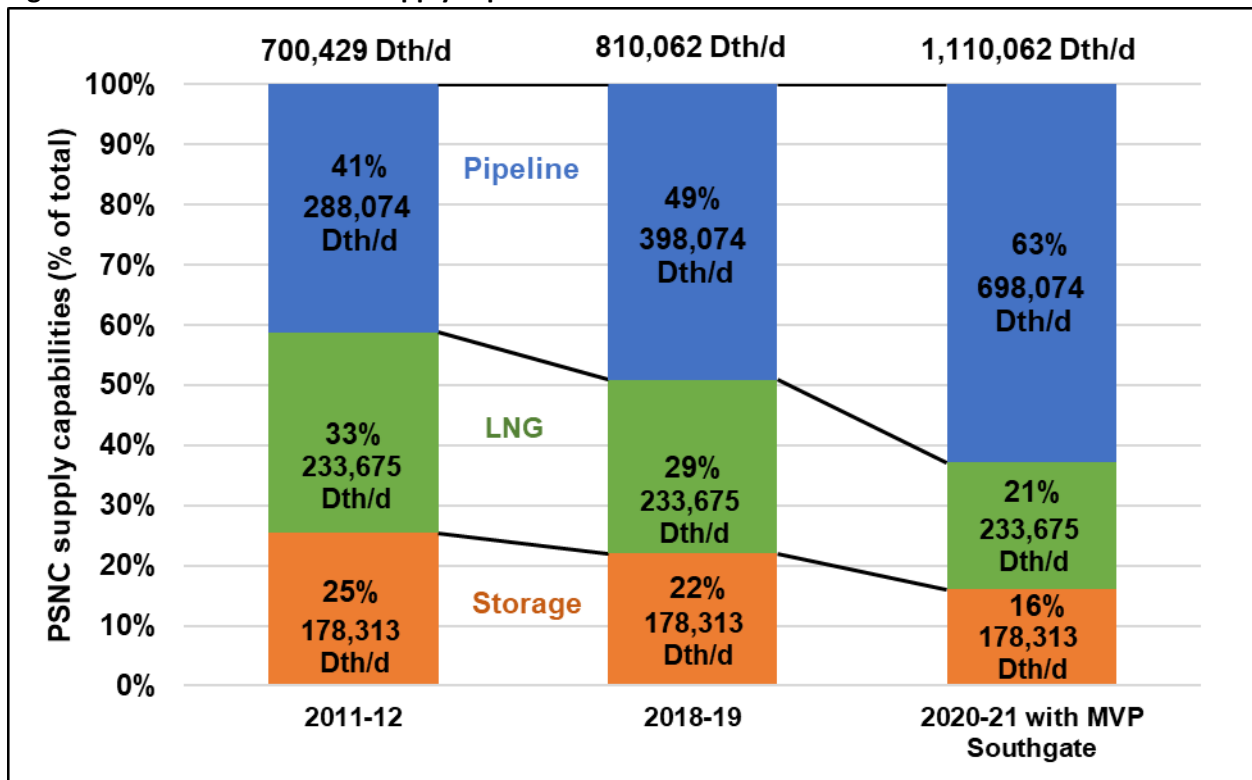
⁴¹ Annual Review of Gas Costs. Public Service Company of North Carolina. Direct Testimony of Rose M. Jackson. Revised Jackson Exhibit 1. NCUC Docket No. G-5, Sub 591. July 2018. Available at: <https://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=0093c4f3-3958-4e47-9747-b8395c29b8b6>



Transmission, LLC (“Columbia Gas”), East Tennessee Natural Gas, LLC (“East Tennessee”) and Saltville Gas Storage Company, LLC (“Saltville”)⁴² that total 178,313 Dth/d.⁴³

Together, these PSNC supply capacities total to 810,062 Dth/d in 2018-2019 (see Figure 6)—up from 700,429 Dth/d in 2010-2011. Pipeline currently represents 49 percent of PSNC’s supply capabilities, while LNG and storage represent 29 and 22 percent, respectively. Contracted capacity on pipelines has grown over time in importance from 41 percent in 2011-2012. Storage and LNG have both declined in their relative importance in PSNC’s current asset portfolio.

Figure 6: Distribution of PSNC supply capabilities



Source data: Annual Review of Gas Costs. Public Service Company of North Carolina. Direct Testimony of Rose M. Jackson. Revised Jackson Exhibit 1. NCUC Docket No. G-5, Sub 591. July 2018. Available at: <https://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=0093c4f3-3958-4e47-9747-b8395c29b8b6>

⁴² Gas from Saltville is transported through the East Tennessee pipeline, and then delivered to PSNC through Transco-Williams.

⁴³ Annual Review of Gas Costs. Public Service Company of North Carolina. Direct Testimony of Rose M. Jackson. Revised Jackson Exhibit 1. NCUC Docket No. G-5, Sub 591. July 2018. Available at: <https://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=0093c4f3-3958-4e47-9747-b8395c29b8b6>



PSNC has also acquired gas transportation service from Williams-Transco's Southeastern Trail Expansion project that likely replaces existing resources.⁴⁴ It is also possible that PSNC could contract additional gas transportation capacity in the Williams-Transco pipeline. There is, however, no publicly available information regarding a new Williams-Transco contract.

Detailed information on PSNC's supply capabilities remains largely confidential. In particular, PSNC has not made the expiration date of each of the contracted supply capabilities currently available to the public. This lack of information makes it difficult to fully evaluate PSNC future supply capacity.

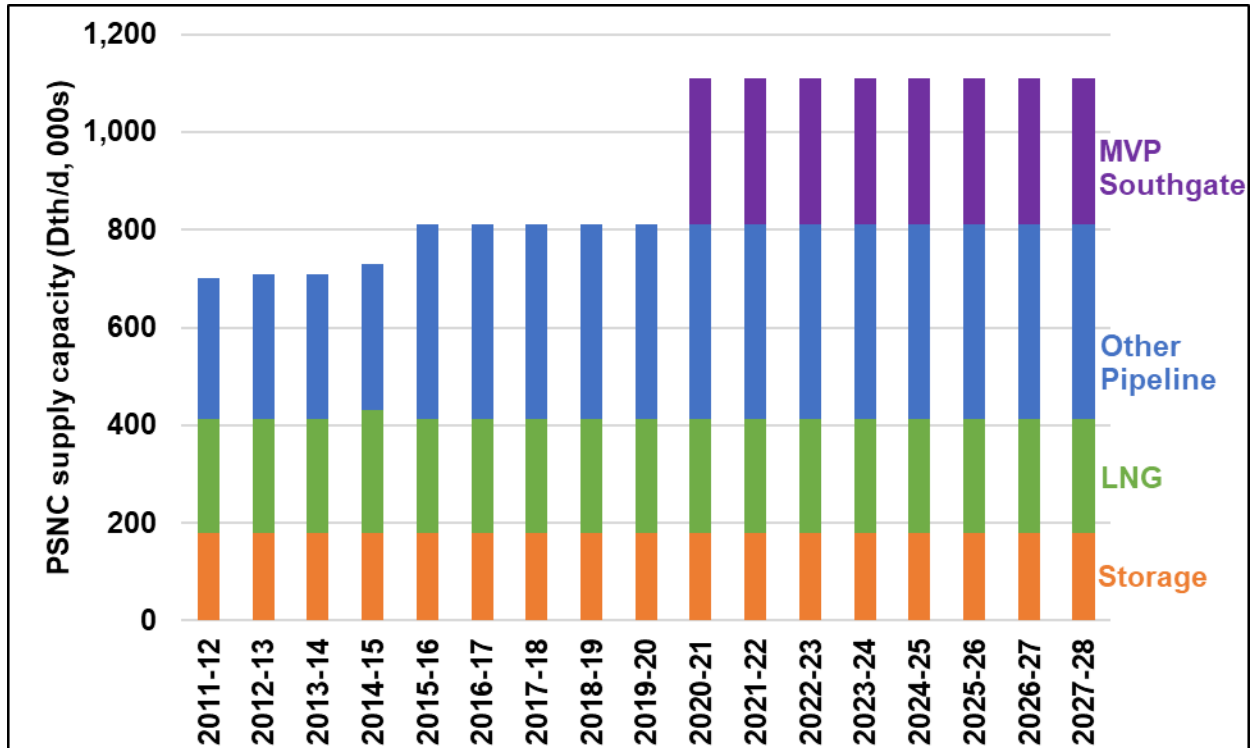
With the addition of MVP Southgate, PSNC future supply capacity would increase by 37 percent

In December 2017, PSNC contracted for 300,000 Dth/d of capacity in the MVP Southgate: 80 percent of the total proposed capacity of the MVP Southgate project: 250,000 Dth/d of capacity from the MVP mainline project (12.5 percent of total MVP mainline capacity), and 50,000 Dth/d from East Tennessee Natural Gas, LLC through a new connection with MVP. The projected in-service start date for MVP Southgate is late 2020. Adding this new capacity would increase PSNC's supply from 810,062 Dth/d, to 1,110,062 Dth/d in 2020-2021. PSNC pipeline capacity would grow by 37 percent in 2020-2021 if MVP Southgate is added (see Figure 7).

⁴⁴ According to PSNC 2018 Annual Review of Gas Costs, "When the project is placed into service, this capacity will allow the Company to schedule deliveries from downstream storage facilities and pipelines on a primary firm, forward-haul basis and will replace the secondary backhaul transportation that PSNC has used in the past." (p.10). This means that PSNC will be able to receive gas that is transported in the same direction as the physical flow of gas in the pipeline (forward haul delivery), instead of gas that is transported in the opposite direction as the physical flow of gas in the pipeline (backhaul delivery), which is limited because it is considered secondary in scheduling priority. Annual Review of Gas Costs. Public Service Company of North Carolina. Direct Testimony of Rose M. Jackson. P.10. NCUC Docket No. G-5, Sub 591. July 2018. Available at: <https://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=0093c4f3-3958-4e47-9747-b8395c29b8b6>



Figure 7: PSNC total expected supply capacity with MVP Southgate



Source: Annual Review of Gas Costs. Public Service Company of North Carolina. Direct Testimony of Rose M. Jackson. Revised Jackson Exhibit 1. NCUC Docket No. G-5, Sub 591. July 2018. Available at: <https://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=0093c4f3-3958-4e47-9747-b8395c29b8b6>. MVP is included from 2020-2021.

PSNC provides no evidence that MVP Southgate will improve its customer reliability

In its application to the North Carolina Utilities Commission (NCUC) for approval of payment of compensation⁴⁵ under a service agreement with MVP LLC,⁴⁶ PSNC claims that the MVP projects will provide direct pipeline access to gas produced in the Marcellus and Utica shale regions and improve reliability and add resiliency to its gas supply.⁴⁷ In this application, PSNC argues that the payment of compensation is in the public interest because “The MVP projects will provide PSNC with a third direct

⁴⁵ Per the NCUC, Payment of compensation is distinct from approval to recover costs from ratepayers. “That for ratemaking purposes, the authority granted herein neither constitutes approval of any amount of compensation paid pursuant to any of the agreements, and the authority granted by this order is without prejudice to the right of any party to take issue with any provision in the agreements in a future proceeding.” Order Accepting Affiliated Agreements for Filing and Permitting Operation Thereunder Pursuant to N.C. Gen. Stat. § 62-153. NCUC Docket No. G-5, Sub 593. October 2018. p.6. Available at: <https://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=da25b62b-36d4-46d1-b246-8cdb6f3e9f05>

⁴⁶ North Carolina public utilities are required to file copies of contracts with affiliates and obtain the Commission’s approval of those contracts with the NCUC. In August 2018, PSNC together with MVP LLC filed the terms of the agreement for the use of transportation capacity in the MVP Southgate project and requested approval of its terms. The rates, terms, and conditions of service of the agreement between PSNC and MVP LLC remain confidential.

⁴⁷ Application for Approval of Payment of Compensation under a Service Agreement with Mountain Valley Pipeline, LLC, Public Service Company of North Carolina. NCUC Docket No. G-5, Sub 593. August 2018. Available at: <https://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=0cad258d-ad79-4aa4-af1c-998cd4fe2f9b>

interstate pipeline connection...which will improve reliability and add resiliency to the interstate pipeline services the Company receives.”⁴⁸

In its application to the NCUC for approval of payment of compensation under a service agreement with MVP LLC, PSNC claims as a benefit of the MVP Southgate that, “In the event of planned or unplanned outages or constraints on one of the pipelines, PSNC would have access to the other pipelines to continue serving its customers without interruption.”⁴⁹

PSNC claims that the MVP Southgate will improve reliability and add resiliency to its gas supply, but does not provide evidence of outages or interruptions to its gas supply in the past or analysis showing that it expects these challenges in the future. Moreover, PSNC appears to have served its customers well with the reliability of gas provided by its supply mix in recent years. In 2018, Market Strategies International-Morpace named PSNC a “Customer Champion” for the fifth consecutive year. Customer Champions were selected for top scores in customer engagement, encompassing brand trust, service satisfaction, and product experience.⁵⁰

The addition of MVP Southgate to PSNC’s supply assets would increase PSNC’s supply capacity by 37 percent compared to PSNC’s own projections of an 11 percent increase in demand by 2025 and 24 percent increase by 2030. No evidence has been provided that PSNC has suffered from an unreliable supply of gas that would require access to another interstate pipeline.

4. Meeting customer needs and alternatives to pipeline supply

PSNC’s forecasted supply of gas is more than sufficient to accommodate the current-day gas demand of its customers. PSNC suggests its customers’ demand will grow over time—and not just by the 1.2 to 1.6 percent annual growth predicted in other recent regional forecasts. PSNC predicts 2.2 percent annual growth. (In 2030, PSNC’s extra predicted growth amounts to 122,000 Dth/d above the Wilson et al. forecast.)

NCUC data show that North Carolina’s non-electric gas sales have declined over the last years, falling 0.1 percent per year on average (see Figure 4 above). Assuming that PSNC’s sales shrink or do not grow over time obviates the need for additional gas capacity. Any gas demand growth rate of 0.3 percent per year or less delays the need for new capacity from 2019 (using PSNC rapid rate of assumed growth) out to 2030 or later.

Future levels of gas demand are uncertain, as evidenced by the wide range of recent forecasts and historical trends. Such uncertainty in the likelihood of the need for additional supply capacity raises

⁴⁸ Application for Approval of Payment of Compensation under a Service Agreement with Mountain Valley Pipeline, LLC. Public Service Company of North Carolina. p.6. NCUC Docket No. G-5, Sub 593. August 2018. Available at: <https://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=0cad258d-ad79-4aa4-af1c-998cd4fe2f9b>

⁴⁹ Application for Approval of Payment of Compensation under a Service Agreement with Mountain Valley Pipeline, LLC. Public Service Company of North Carolina. p.6. NCUC Docket No. G-5, Sub 593. August 2018. Available at: <https://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=0cad258d-ad79-4aa4-af1c-998cd4fe2f9b>

⁵⁰ Source: PSNC Website, Newsroom. December 11, 2018. Available at: <https://www.psnenergy.com/about-us/newsroom/2018/12/11/psnc-energy-named-a-2018-customer-champion-in-utility-study>



important questions regarding the best use of ratepayer funds in ensuring uninterrupted gas supply. Two main characteristics of potential supply- and demand-side resources are of particular concern: (1) the lifetime of new infrastructure; and (2) the cost of increasing supply or decreasing demand at times of peak gas demand.

Given such fundamental uncertainties as future customer demand, emerging technologies and falling technology costs, and the landscape of state and federal regulations, investment in gas pipelines with expected lifetimes in excess of 40 years may pose risks. Amortization of costly gas delivery infrastructure over many decades will only result in good decision making for ratepayers if this infrastructure does in fact remain used and useful over that expected lifetime.

Gas energy efficiency and other demand-side programs may be an inexpensive alternative to pipeline investments. Efficiency and peak shaving measures reduce customer demand and, therefore, reduce any potential shortfall between supply and demand. Efficiency programs reduce the amount of gas needed to provide the same level of energy and heating and can be a cheap and effective way to reduce peak demand. Energy efficiency programs that are specifically targeted at peak usage increase the potential to shave gas system peaks.

Electric energy efficiency programs place a specific value on avoided costs on peak, usually calculated at the avoided capacity cost in dollars per megawatt. To date, gas energy efficiency programs typically do not. It is important to note that the direct cost to the utility of administering a gas energy efficiency program is not the net cost that includes the benefits of gas energy efficiency, including avoided gas use, avoided water use, and positive health impacts and other non-energy benefits. Gas energy efficiency programs are operated all over the United States based on estimates of their net costs (which do not typically include a dollar value for peak shaving benefits) as “all cost effective”, or having benefits equal to or greater than their costs. The cost of gas energy efficiency is calculated in many states as net negative: that is, each unit of energy efficiency confers benefits that are greater than its costs before including the added benefit of peak shaving.

Depending on uncertain forecasts of customers’ future demand for gas, additional supply resources in the MVP Southgate area may not be necessary. In the event that customer demand exceeds available supply, several alternative supply- and demand-side options may be available at lower or equal cost to building new pipeline infrastructure that will lock in investment in gas supply for another 40 years.