



Applied Economics Clinic

Economic and Policy Analysis of Energy, Environment and Equity

Ratepayer Impacts of ConEd's 20-Year Shipping Agreement on the Mountain Valley Pipeline

Prepared for the Environmental Defense Fund

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Executive Summary

The Mountain Valley Pipeline is a proposed new natural gas pipeline in West Virginia and Virginia, and is intended to bring low-cost natural gas out of the Marcellus and Utica Shales to markets in the Southeast and Mid-Atlantic. In January 2016, three months after the certificate application for the project was filed at the Federal Energy Regulatory Commission, Con Edison Gas Midstream, a non-utility subsidiary of corporate parent Consolidated Edison, Inc., announced that it was acquiring a 12.5 percent ownership interest in Mountain Valley Pipeline. At the same time, Consolidated Edison Company of New York, Inc., a regulated gas and electric utility owned by the same corporate parent, entered into a 20-year transportation agreement for 250,000 dekatherms per day of firm natural gas capacity on the proposed pipeline.

ConEd ratepayers will pay the costs to transport natural gas, while shareholders in Consolidated Edison, Inc. would benefit from any profits earned by the pipeline.

Prior to late-2016, an oversupply of natural gas from the Marcellus/Utica region, combined with constraints on pipeline infrastructure, kept prices in the region reliably cheaper than at Henry Hub in Louisiana—historically the benchmark price for U.S. natural gas. This glut of natural gas in the region has eased over the past year, however, as new pipelines and pipeline expansion projects have enabled this surplus natural gas to reach consumers and led to increasing prices in the Marcellus and lower prices in regions that had not previously had access to this natural gas. This difference in prices between regional pricing hubs is known as the “basis differential.” As additional natural gas pipeline capacity became available, basis differentials between regional pricing hubs narrowed appreciably as prices in Appalachia rose and prices at other hubs declined.

Given that the MVP project had already been filed with FERC, ConEd customers would benefit from the diminishing basis differentials resulting from the project, whether or not the utility signed a 20-year transportation contract. Rather than contracting for firm transportation service, ConEd could purchase gas out of the MVP and into Transco Zone 5, using its existing transportation rights on the Transco pipeline to bring that gas to its City Gate. However, because Con Ed has committed its ratepayers to a 20-year transportation contract, the costs of this transportation capacity must be considered when assessing the value to ratepayers. Applied Economic Clinic was asked by the Environmental Defense Fund to determine whether ConEd’s transportation contract on the MVP would result in unjust and unreasonable costs to ratepayers. We find that the expected benefit of the MVP was quickly disappearing at the time ConEd signed the transportation contract due to the falling basis differentials between the MVP supply and market regions, which erode the benefits of shipping agreements.

Narrowing basis differentials turned a net present value ratepayer benefit of more than \$1 billion into an anticipated \$630 million cost given current natural gas pricing.

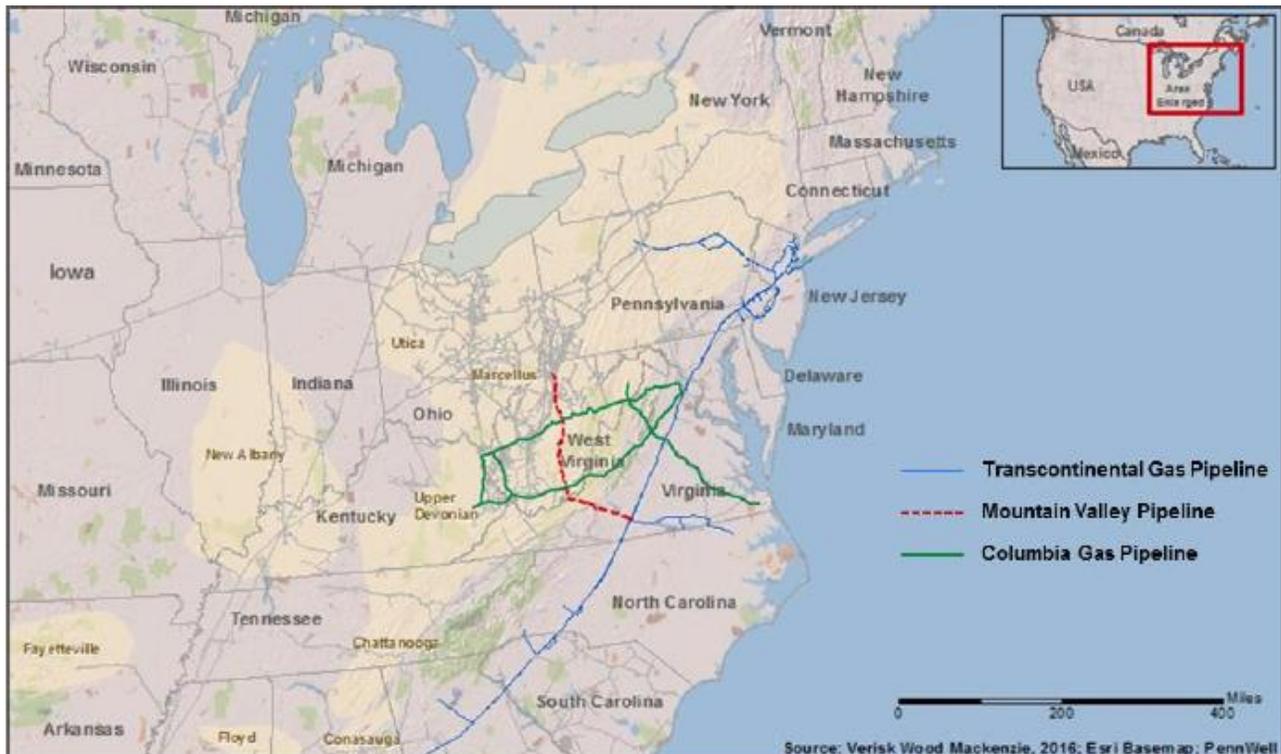
The nominal costs of ConEd’s MVP contract and associated gas supply, which in total will be \$1.2 billion over the course of the 20-year agreement, will be shouldered by New York ratepayers, whether or not the pipeline capacity is actually used. As the New York State Public Service Commission evaluates these transportation costs, it should consider Con Ed’s ownership interest in this pipeline and the burden of risk that this contract shifts from shareholders to ratepayers.



I. Shipping Costs on the Mountain Valley Pipeline Will Be Paid for by ConEd Ratepayers

The Mountain Valley Pipeline (MVP) is a proposed new natural gas pipeline that would stretch 303 miles from the Equitrans transmission system in Wetzel County, West Virginia to connect to the Transco natural gas pipeline at the Transco Zone 5 compressor station in Pittsylvania County, Virginia.¹ The proposed pipeline route is shown in Figure 1, below.

Figure 1. Mountain Valley Pipeline Route



Source: Wood Mackenzie. 2017. *Mid-Atlantic Natural Gas Demand in Support of the Mountain Valley Pipeline Project*.

On January 22, 2016, Con Edison Gas Midstream, a non-utility subsidiary of corporate parent Consolidated Edison, Inc., announced that it was acquiring a 12.5 percent ownership interest in Mountain Valley Pipeline, LLC, which is a joint venture between EQT Midstream Partners, LP; NextEra US Gas Assets, LLC; WGL Midstream; and RGC Midstream, LLC.² This was Con Edison Gas Midstream's first investment in natural gas infrastructure.³ On the same day, Consolidated

¹ Mountain Valley Pipeline. 2017. Overview. Available at: <https://www.mountainvalleypipeline.info/overview>

² Mountain Valley Pipeline, LLC. 2016. Mountain Valley Pipeline Secures New Shipper Commitment with Con Edison. News Release.

³ Con Edison Transmission. 2017. Projects. Available at: <http://www.conedtransmission.com/projects.asp>



Edison Company of New York, Inc. (ConEd), a regulated utility (owned by the same corporate parent) that provides electric, gas, and steam service in New York City and Westchester County, entered into a 20-year transportation agreement with Mountain Valley Pipeline, LLC for 250,000 dekatherms per day (Dthd) of firm natural gas capacity on the MVP.⁴

These long-term natural gas transportation agreements are important to pipeline developers for two reasons:

- First, pipeline developers typically use these agreements as evidence to the Federal Energy Regulatory Commission (FERC) that there is a need for the project, which must be demonstrated before FERC will grant its approval to build the pipeline. In its application, Mountain Valley Pipeline, LLC stated that "...the increasing natural gas demand by local and regional markets, and the Project shippers' contractual commitments for the entire capacity of the project, are clear evidence of the need for the Mountain Valley Project."⁵
- Second, long-term contracts with shippers, called "anchor" or "foundation" shippers, are also important to pipeline developers as a way to attract financing to fund the project, as they facilitate lenders' confidence that the project's costs will be recovered from shippers and that lenders will be paid the interest on their loaned money.

The existence of long-term transportation agreements for firm natural gas capacity thus aids directly in the construction of new natural gas pipelines by increasing the likelihood of securing both regulatory approval and project financing.

When natural gas begins to travel on a new pipeline, the cost of shipping that gas becomes an operating cost for the capacity purchasing utility. A regulated utility passes that cost, which includes both the actual cost of moving the natural gas as well as a FERC-approved rate of return to the pipeline owners, on to its customers. Pending approval by the New York Public Service Commission, ConEd ratepayers will pay the costs associated with the 20-year transportation agreement on the Mountain Valley Pipeline. Shareholders in Consolidated Edison, Inc., the parent company of ConEd and Con Edison Gas Midstream, would benefit from any profits earned by the pipeline. Any analysis of ConEd's interest in this project must be viewed in light of this affiliate relationship and the potential shifting of risk from shareholders to ratepayers.

II. New Pipeline Capacity Lowers Differences in the Cost of Natural Gas between Regions

In the absence of other significant influences, the construction of new natural gas pipelines would be driven by market demand for, and supply of natural gas, with new pipelines being constructed along paths that would bring large volumes of natural gas supply to areas of high demand. Market inefficiencies or constraints on pipeline capacity lead to regional differences in natural gas prices, which are typically expressed as the difference in natural gas prices between two locations or "hubs." The difference in natural gas prices between two regional hubs is known as the "basis

⁴ Mountain Valley Pipeline, LLC. 2016. Mountain Valley Pipeline Secures New Shipper Commitment with Con Edison. News Release.

⁵ Mountain Valley Pipeline, LLC. 2015. Application of Mountain Valley Pipeline, LLC for Certificate of Public Convenience and Necessity and Related Authorizations. Docket No. PF15-3-000. Page 10.



differential.” The greater the basis differential between regions, the greater the incentive for pipeline developers to construct new capacity to move natural gas from a lower price region into a higher price region. When that new capacity comes online, natural gas prices should both become less volatile and equilibrate as the basis differentials between the supply and the demand regions diminishes. According to the U.S. Department of Energy, shippers that contract for firm transportation service can rely on their contracts “to capture the resulting basis differential. Basis differentials, and how the captured revenues compare to the cost of constructing pipelines, largely determine how much and in which locations pipeline capacity is likely to be added.”⁶

This dynamic can be observed in Appalachia, where prices in the region depend on production rates and the availability of natural gas transportation infrastructure. Shippers on the Mountain Valley Pipeline justify their long-term contracts with the argument that they will make it possible to take advantage of cheaper natural gas from the Marcellus and Utica shales once the pipeline is operational. Indeed, an oversupply of natural gas from the region, combined with constraints on pipeline infrastructure, has kept prices in the region reliably cheaper than at Henry Hub in Louisiana—historically the benchmark price for U.S. natural gas. This glut of natural gas in Appalachia has eased over the past year, however, as new pipelines and pipeline expansion projects have enabled this surplus natural gas to reach consumers and led to increasing prices in the Marcellus and lower prices in regions that had not previously had access to this natural gas.

According to the U.S. Energy Information Administration (EIA), the difference between the price of natural gas at Henry Hub and the prices at the various hubs in Appalachia has narrowed as new pipeline projects and expansions have been completed. Prices at Dominion South (in southwestern Pennsylvania) averaged \$0.76 per MMBtu lower than Henry Hub in the first seven months of 2016. Between July and December of 2016, more than 3.0 Bcf/d of interregional capacity was added, and the average basis differential between the two hubs dropped to a difference of \$0.53 per MMBtu during the first seven months of 2017.⁷

Figure 2, below, presents daily natural gas prices for two price hubs—Dominion South and Henry Hub—from October 2013 through May 2017 and shows a notable tightening of the difference between prices at these hubs, with an obvious convergence of these price points starting in October 2016 following the completion of the Ohio Valley Connector Expansion and the Rockies Express Pipeline Zone 3 expansion.⁸ There are 25 additional pipeline projects in development that are scheduled to be completed by the end of 2017, which would add an additional 7.2 Bcf/d of natural gas transportation capacity.⁹ If the pipeline capacity expansion keeps pace with, or exceeds, the production of shale gas then one would expect the basis differentials between regions to disappear and the prices of natural gas to equilibrate between regions.

⁶ US Department of Energy. 2015. Natural Gas Infrastructure Implications of Increased Demand from the Electric Power Sector. Page 3. Available at:

https://energy.gov/sites/prod/files/2015/02/f19/DOE%20Report%20Natural%20Gas%20Infrastructure%20V_02-02.pdf

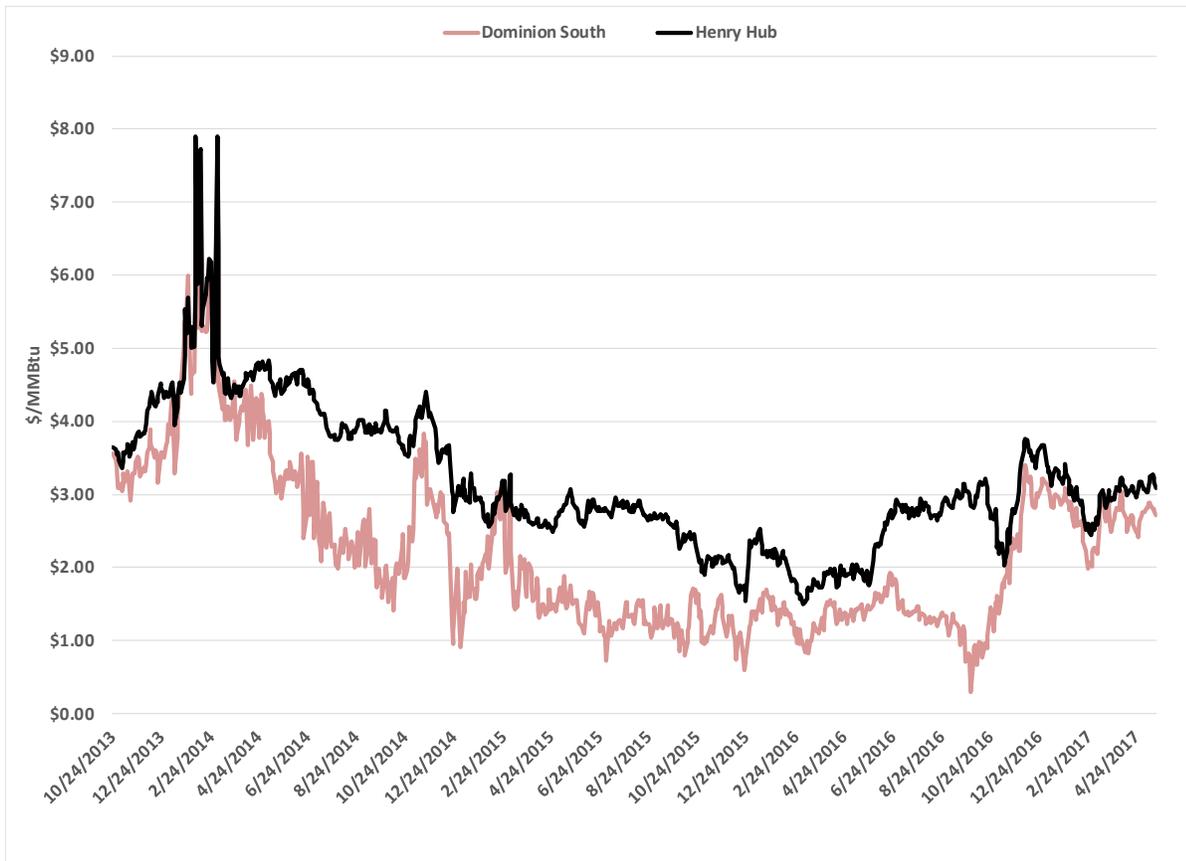
⁷ US Energy Information Administration. 2017. Natural gas pipeline projects lead to smaller price discounts in Appalachian region. Available at: <https://www.eia.gov/todayinenergy/detail.php?id=32512>

⁸ *Id.*

⁹ *Id.*



Figure 2: Historical Natural Gas Prices for Dominion South and Henry Hub (\$/MMBtu)¹⁰

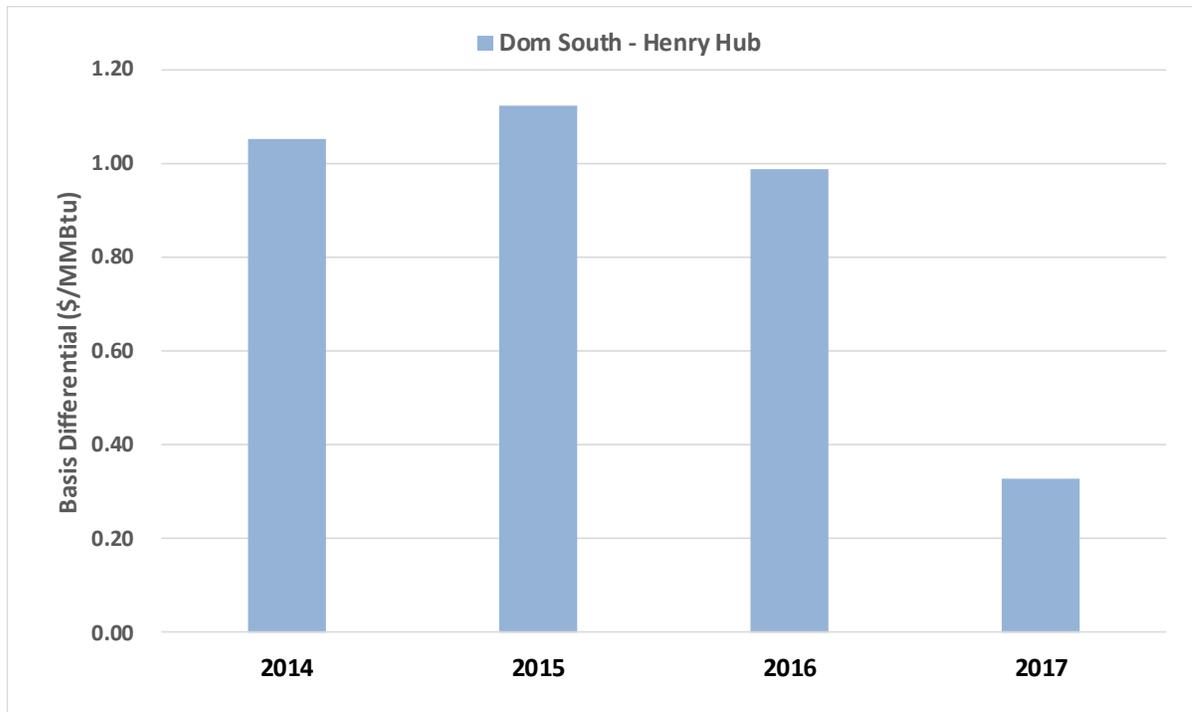


The change in annual average basis differentials from 2014 to 2017 (partial year) between Dominion South and Henry Hub is shown in Figure 3.

¹⁰ Natural Gas Intelligence, Historical Daily Prices. (<http://www.naturalgasintel.com/>)



Figure 3: Basis Differential between Dominion South and Henry Hub (\$/MMBtu)¹¹



As shown in Figure 3, Dominion South natural gas was more than \$1 per MMBtu cheaper than at Henry Hub in 2014, and this basis differential persisted for the next two years. However, with the new pipeline capacity that came online in late 2016 and early 2017, the annual average basis differential between these regions fell by 67 percent. This means that much of Dominion South’s previous discount (relative to Henry Hub) for shale gas resulting from oversupply conditions has disappeared.

III. The Value of the Mountain Valley Pipeline Has Declined Over Time

The non-binding open season for the MVP project was announced in June 2014, inviting commitments for contracts for firm transmission capacity.¹² By September, the project had received firm capacity commitments totaling 1.5 Bcf/d—a milestone that an EQT officer stated “confirms that we have an economically viable project.”¹³ Indeed, natural gas production in 2014 in the Marcellus Shale had outpaced growth in the natural gas pipeline capacity in the region, leading

¹¹ *Id.* Note that the data presented for 2017 include January 1 through May 19 only. Basis differentials between Dominion South and Henry Hub increased slightly in June and July, which accounts for the \$0.53 per MMBtu difference reported by EIA and discussed on page 6 of this report.

¹² EQT. June 2014. EQT and NextEra Energy Announce Southeast Pipeline Project. Available at: <http://media.eqt.com/press-release/eqt-and-nextera-energy-announce-southeast-pipeline-project>

¹³ EQT. September 2014.



to an oversupply of natural gas and declining prices at regional hubs and a basis differential of more than \$1.00 per MMBtu between Dominion South and Henry Hub.¹⁴ Based on these 2014 price differentials, the Mountain Valley Pipeline appeared to be a reasonable project to undertake, as foundation shippers contracting for firm transmission capacity would have had access to lower cost natural gas from the surrounding region.

The value of these 20-year foundation transportation agreements on the MVP has diminished over time, however, with the addition of new and expanded pipeline capacity that came online at the end of 2016 and the beginning of 2017, as discussed in Section II above.¹⁵ The diminishing value is evidenced through the dissipating basis differentials between Transco Zone 5, Dominion South, and TETCO M2 hubs versus Henry Hub. Transco Zone 5 was selected for this analysis because it is the point at which the MVP connects to the Transco pipeline, and is the area in which ConEd would buy gas in the absence of the MVP. The Dominion South and TETCO M2 hubs were selected because they are the pricing hubs at which ConEd would purchase natural gas that would then be shipped on the MVP under the 20-year contract.¹⁶ The locations of those pricing hubs are shown in Figure 4, below.

¹⁴ US EIA. 2014. Some Appalachian natural gas spot prices are well below the Henry Hub national benchmark. Available at: <https://www.eia.gov/todayinenergy/detail.php?id=18391>

¹⁵ During this timeframe, the ownership structure of the Mountain Valley Pipeline project changed, with Vega Midstream MVP LLC, WGL Midstream, and RCG Midstream joining EQT Corporation and NextEra Energy Inc. as owners of the project. WGL Midstream purchased Vega Midstream MVP LLC's ownership interest on October 31, 2016. Business Wire, "WGL Midstream Acquires Additional 3 Percent in Mountain Valley Pipeline," (October 31, 2016), <http://www.businesswire.com/news/home/20161031005163/en/WGL-Midstream-Acquires-Additional-3-Percent-Interest>.

¹⁶ In 2018, the difference is taken between the average basis differentials from 2014-2017 from TCO (Columbia Gas) and Transco Zone 4 in order to represent the change in basis differential that might be expected when the MVP begins operation.



Figure 4. Map of natural gas pricing hubs

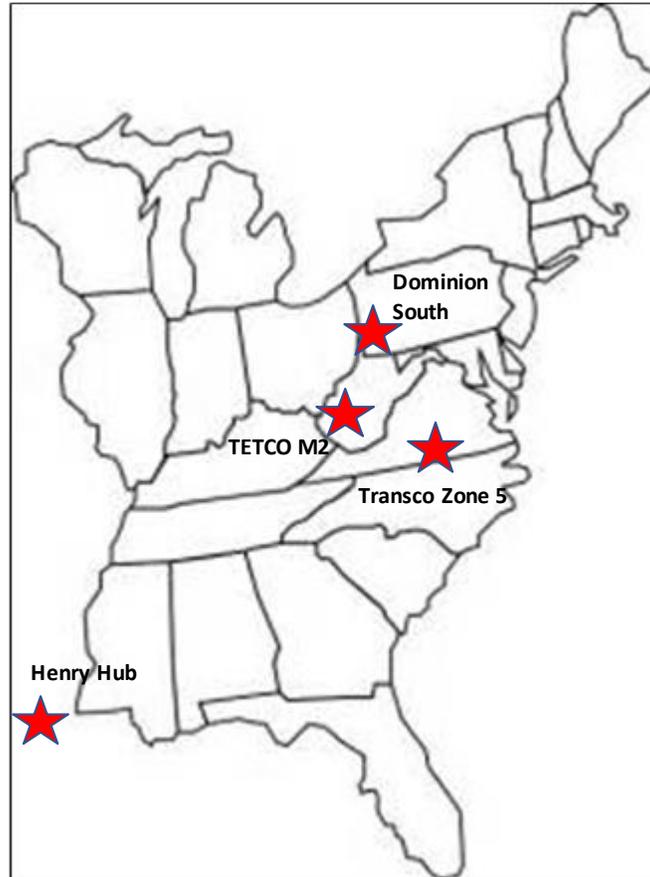
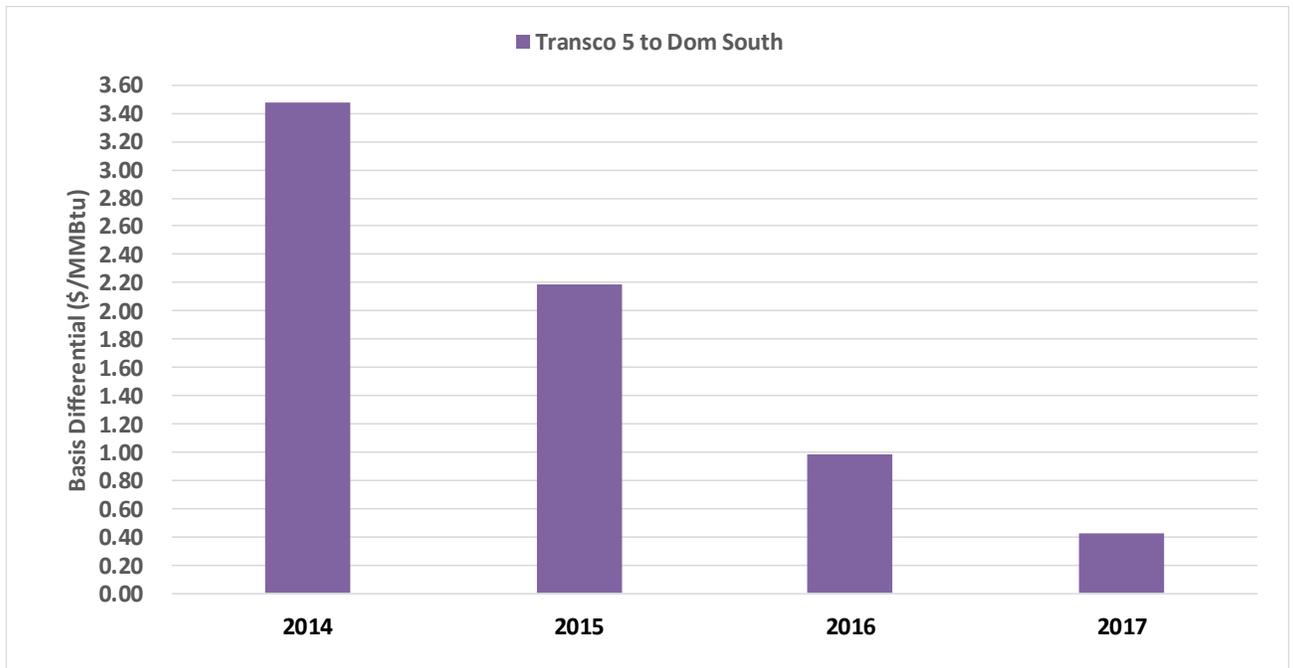


Figure 5, below, shows the shrinking basis differentials between Transco Zone 5 and Dominion South from 2014 to 2017 (partial year). This means that customers are already receiving the benefits of lower natural gas prices due to expanding pipeline capacity, as prices are equilibrating across regions and hubs.



Figure 5: Basis Differential between Transco Zone 5 and Dominion South (\$/MMBtu)¹⁷



Additional analysis of these regional basis differentials¹⁸ demonstrates the diminished value of the MVP pipeline over time, which is arrived at by subtracting the supply area basis differential (i.e., average of the differentials from Dominion South to Henry Hub and TETCO M2 to Henry Hub) from the Transco Zone 5 to Henry Hub basis. This represents the difference between the costs of:

- (1) Natural gas that could be procured from the Marcellus and delivered via the Mountain Valley Pipeline, and
- (2) Natural gas purchased at Transco Zone 5.

¹⁷ *Id.* After July 1, 2016, Transco 5 is represented by Transco 5 North.

¹⁸ This analysis was prepared by Greg Lander of Skipping Stone, and provided to us by EDF. Under these given assumptions, we calculated the basis differential change as follows. The basis of TETCO M2 from the Henry Hub, (a negative number), and the basis of Dominion South from the Henry Hub, (also a negative number), were averaged to calculate a composite basis supply area. Then the basis of Transco Zone 5 from the Henry Hub (a positive number in the years and in 2017, alternating between slightly negative and slightly positive numbers) was calculated to arrive at the market area basis. To calculate the value of the basis differential between the supply area and the market area, the supply area basis is subtracted from the market area basis. Subtraction of the supply area basis (a negative number) from the market area basis (recently sometimes slightly negative and sometimes slightly positive) yields the basis differential, which represents the value of holding capacity to connect those two regions. Subtracting a negative number in a supply area is the same as adding the absolute value of that number to the market area value.



This difference does not include the cost of shipping. The difference between these basis differentials is the value of the MVP; it diminishes over time as shown in Table 1. The timeline begins in 2015, the first full year in which foundation shipping agreements were available for contract on the MVP.

Table 1: Value of MVP Capacity over Time¹⁹

Year	Value of MVP Capacity (Dth/d)
2015	\$2.17
2016	\$0.99
2017	\$0.42
2018 and forward	\$0.08

IV. Con Ed’s MVP Contract Will Result in Higher Costs to Ratepayers

The Mountain Valley Pipeline developers filed an application for a certificate of public convenience and necessity with FERC on October 23, 2015. Three months later, on January 22, 2016, ConEd announced its decision to become a shipper and Con Edison Gas Midstream an owner of the project. ConEd’s stated rationale for signing up for service on the project was to gain access to lower cost natural gas supply for its customers.²⁰ The New York Public Service Commission evaluates the prudence of utilities’ decisions at the time they enter into transactions,²¹ noting that “[c]ompetitive conditions and market prices and proper provision for the future must be taken into account.”²² It is, therefore, imperative that the pricing dynamics are analyzed with a view to the time at which Con Ed made the decision to enter into this agreement (i.e., January 2016), taking into account the forecasts and projections of future trends with respect to natural gas supply, demand, and pricing that were available at that time.

¹⁹ 2015 through 2017 values are actuals. The 2018 and forward value is calculated based upon long-term dynamics at work in the relevant supply and market areas. We assumed that the completion of projects already under construction would relieve over-supply issues in the supply area and increase supply to the market area such that those respective area prices would equilibrate to their adjacent pricing hubs. In the case of the MVP supply area, those prices are assumed to converge with the Columbia Gas Transmission supply pool (TCO Pool) while the Transco Zone 5 prices would converge with the Transco Zone 4 pricing point. The result is a lower basis differential across MVP over the long term.

²⁰ See Consolidated Edison 2016 Rate Case, Case 16-G-0061, Ivan Kimball Gas Supply Testimony at page 21.

²¹ *Long Island Lighting Co. v. Pub. Serv. Comm’n.*, 134 A.D.2d 135 (N.Y. App. Div 3d Dep’t 1987) (explaining that the legal test for prudence is whether the utility acted reasonably, under the circumstances at the time, “considering that the company had to solve its problems prospectively, rather than in reliance on hindsight.”).

²² *In the Matter of Republic Light, Heat and Power Co., Inc. v. Pub. Serv. Comm’n of N.Y.*, 265 A.D. 74 (N.Y. App. Div 3d Dep’t 1942).



With this framework in mind, Applied Economics Clinic was asked by Environmental Defense Fund to perform an assessment of whether ConEd’s subscription of capacity on the Mountain Valley Pipeline would result in unjust and unreasonable costs to ratepayers. Given that the project had already been filed at FERC, ConEd could benefit from the diminishing basis differentials resulting from the project, irrespective of whether it signed a 20-year transportation contract. In short, ConEd could purchase gas out of MVP and into Transco Zone 5 and use its existing transportation rights on Transco to bring that gas to its City Gate.

Because Con Ed has already committed its ratepayers to a 20-year transportation contract, however, the costs of this transportation capacity must be considered in assessing the value to ratepayers. We estimated the ratepayer impact of the 20-year transportation agreement over time using EDF’s assumption of a \$29.60 per Dthd monthly cost of ConEd’s MVP contract.²³ At a load factor rate of 100 percent, and with an assumed 20 percent discount for foundation shippers, the likely ConEd shipper rate was estimated by EDF to be \$0.78 per Dth.²⁴ EDF added the value of the MVP capacity, shown above, to this shipper cost to arrive at the net daily cost to ConEd ratepayers of natural gas plus transportation. By multiplying this cost by the ConEd subscription of 250,000 dekatherms per day, we estimated costs (or savings) to ratepayers. These costs (or savings) are shown in Table 2. Red values in parentheses represent savings to consumers from the MVP, from a lower cost of gas from the Marcellus plus MVP transportation than the cost of purchasing gas at Transco Zone 5. The values in black represent a cost to consumers of Marcellus gas plus MVP transportation, above the cost of purchasing gas at Transco Zone 5.

Table 2: Costs/(Savings) to Ratepayers from the 20-year transportation agreement and cost of Marcellus gas²⁵

Year	2015	2016	2017	2018+
NPV 20-year gas + contract cost	(\$1,244,597,148)	(\$186,241,814)	\$318,369,888	\$629,876,647
Average annual cost	(\$62,229,857)	(\$9,312,091)	\$15,918,494	\$31,493,832
Levelized net cost (\$/MMBTU)	(\$1.39)	(\$0.21)	\$0.36	\$0.70

Under these assumptions, the MVP would have had a benefit to ConEd ratepayers in 2015 and 2016 due to the basis differentials that existed between natural gas pricing hubs in the Marcellus and Henry Hub, but the expected benefit was rapidly diminishing at the time ConEd entered into a contractual obligation for firm transportation service. As new and expanded pipeline capacity came online at the end of 2016 and the beginning 2017, basis differentials between the MVP supply and market regions fell, eroding the benefits of the shipping agreement on the Mountain Valley

²³ This value is derived from MVP’s FERC application in Docket No. CP16-10 at Exhibit N (Revenues, Expenses, and Income).

²⁴ The \$29.60 monthly reservation rate is rounded up from \$29.5967 in MVP’s FERC application at Exhibit N. Assuming an average of 30.4 days per month in a 12 month year (i.e., 365/ 12) the daily reservation rate is derived by dividing \$29.60 by 30.4 or \$0.9730 per Dth per day. Then discounting this by 20% yields the assumed \$0.78 per Dth per day (Dthd).

²⁵ Average annual cost and levelized net cost are on an NPV basis.



Pipeline. It is difficult to fathom how ConEd could have failed to anticipate these diminished basis differentials, given the volume of pipeline capacity expected to come online during this period, and the number of projects still in advanced stages of development.

V. The MVP Contract Locks Con Edison Customers into Higher Rates for 20 Years

In its most recent natural gas rate case in 2016, ConEd witness Ivan Kimball stated that the Company “is looking to select pipeline projects that increase the reliability of our system, increase our flexibility, provide access to an abundant source of supply, are feasible to complete, and provide delivered gas that is economic compared to existing alternatives.”²⁶ Signing a 20-year transportation agreement on the MVP for 250,000 dekatherms per day runs counter to this strategy of increasing flexibility at a lower delivered cost of natural gas. With the signing of this agreement, ConEd customers are locked into the 20-year transportation costs on the Mountain Valley Pipeline at a total nominal cost of \$1.2 billion over twenty years.²⁷ The utility must also purchase natural gas from a supplier along the pipeline in order to utilize that firm transportation capacity. Natural gas from the MVP must be shipped along additional pipelines, incurring additional shipping fees, in order to bring it to customers in ConEd’s service territory. If lower priced natural gas becomes available elsewhere, ConEd loses the opportunity to purchase that gas and pass those lower prices on to consumers. ConEd ratepayers are locked into higher prices for the 20-year duration of the Mountain Valley Pipeline agreement.

Given that the MVP had a sufficient number of signed shipper agreements to confirm that the project was “economically viable” in 2014, and that MVP filed a certificate application with FERC three months before ConEd decided to take service on the project, the pipeline construction would have proceeded whether or not ConEd committed its customers to a 20-year obligation to buy transportation service. Nonetheless, the utility has obligated its ratepayers to take on the costs to reserve shipping rights on that new pipeline.

The costs of the MVP contract, which total \$1.2 billion (nominal) over the course of the 20-year contract, will be shouldered by New York ratepayers, whether or not the pipeline capacity is used.²⁸ These transportation costs are recovered from ratepayers as part of a gas cost reconciliation process before the New York State Public Service Commission. As the Commission assesses these costs, it has a responsibility to consider the affiliate relationship underpinning ConEd’s interest in this pipeline and require ConEd to demonstrate that its decision to enter into this agreement is in the public interest.

²⁶ See Consolidated Edison 2016 Rate Case, Case 16-G-0061, Ivan Kimball Gas Supply Testimony at page 22. Available at: <https://legacyold.coned.com/2016-rate-filing/pdf/testimony-exhibits-gas/13-gas-supply-testimony-final.pdf>

²⁷ And a net present value cost of over \$600 million, as calculated above.

²⁸ This cost could be reduced to \$600 Million of net cost, only if the capacity is fully used and the calculated \$0.08 per Dth “value” is realized thus reducing the \$0.78 per Dthd cost to \$0.70 per Dthd. However, this would only be the case if there are no other sources of supply into pipelines directly connected to ConEd that are more advantageous than receiving gas into Transco at the Zone 5 terminus of MVP.