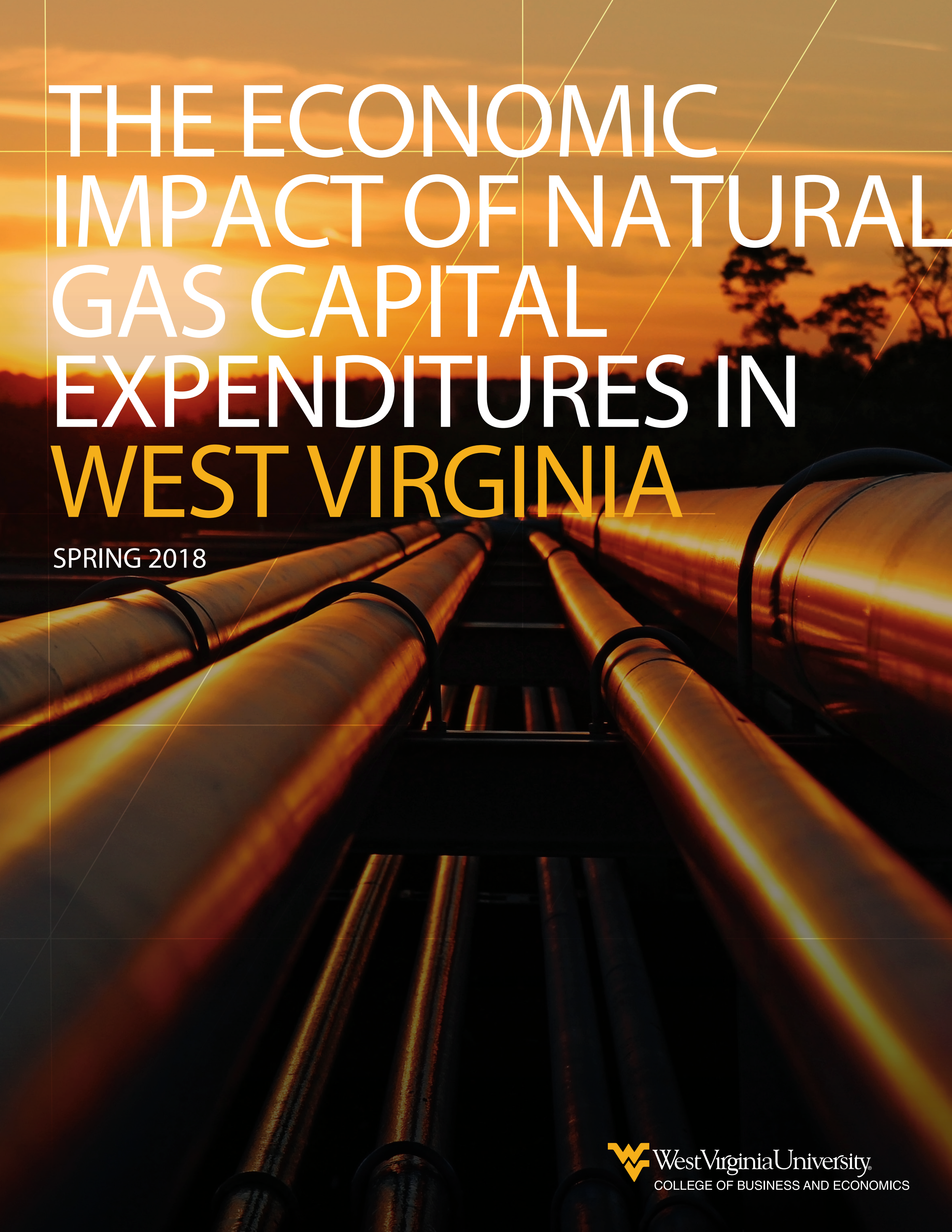
THE ECONOMIC IMPACT OF NATURAL GAS CAPITAL EXPENDITURES IN WEST VIRGINIA

SPRING 2018



West Virginia University
COLLEGE OF BUSINESS AND ECONOMICS

The Economic Impact of Natural Gas Capital Expenditures in West Virginia

is published by:
Bureau of Business & Economic Research
West Virginia University College of Business and Economics

(304) 293-7831
bebureau@mail.wvu.edu
bber.wvu.edu

WRITTEN BY

Eric Bowen, PhD
Research Assistant Professor

Funding for this research was provided by Dominion Energy and Mountaineer Gas Co. The opinions herein are those of the authors and do not necessarily reflect those of the West Virginia Higher Education Policy Commission or the West Virginia University Board of Governors.

Table of Contents

List of Figures and Tables

Executive Summary

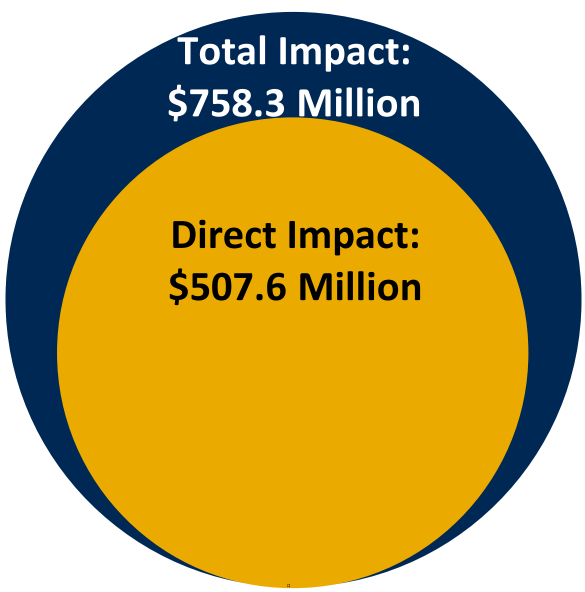
In 2015 the West Virginia Legislature adopted Senate Bill 390 (SB 390), which allowed the state's natural gas utilities to recoup costs associated with natural gas pipeline construction more rapidly than under previous rules. The law was designed to encourage the state's natural gas utilities to expand their systems to unserved and underserved areas of the state. In addition, the law aims to accelerate replacement of aging pipelines, which have the potential to corrode, producing a higher leakage rate than more modern technology.

Since the passage of SB 390, the state's natural gas utilities have increased their capital expenditures, replacing aging pipelines and building new infrastructure. In this report, we estimate the economic impact of these capital expenditures between 2006 and 2018 in West Virginia by the two largest natural gas utilities in the state, Mountaineer Gas and Dominion Energy.

Our primary findings are as follows:

- **The total economic contribution of capital expenditures between 2006 and 2018 is estimated to be more than $750 million.** Of this about $508 million comes from direct spending, and remaining $251 million comes through secondary impacts.
- **Capital expenditures are estimated to have supported more than 5,400 jobs** over 13 years.
- Dominion Energy is estimated to have had an impact of more than $380 million and 2,721 job-years.
- Mountaineer Gas is estimated to have contributed a total of $378 million of economic impact and about 2,699 job-years.

Figure 1: Total Economic Impact of Natural Gas Capital Expenditures



1 Introduction

In 2015 the West Virginia Legislature adopted Senate Bill 390 (SB 390), which allowed the state's natural gas utilities to recoup costs associated with natural gas pipeline construction more rapidly than under previous rules. The law was designed to encourage the state's natural gas utilities to expand their systems to unserved and underserved areas of the state. In addition, the law aims to accelerate replacement of aging pipelines, which have the potential to corrode, producing a higher leakage rate than more modern technology.

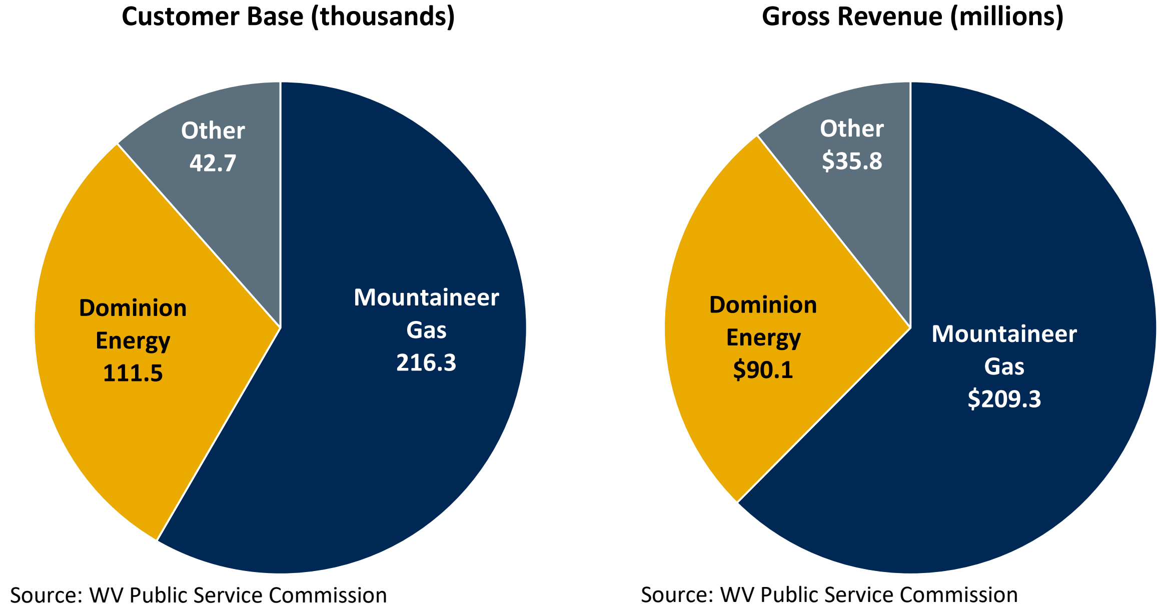
Since the passage of SB 390, the state's natural gas utilities have increased their capital expenditures, replacing aging pipelines and building new infrastructure. In this report, we estimate the economic impact of these capital expenditures in West Virginia by the state's two largest natural gas utilities, Dominion Energy and Mountaineer Gas Co. While it is reasonable to assume that Senate Bill 390 provided additional incentives for the state's utilities to increase infrastructure spending, it is beyond the scope of this project to attribute a given amount of spending to the law itself. Instead, we estimate the overall economic impact of all capital expenditures by both companies from 2006 to 2018. We provide estimates of this impact in four areas: output, employment, employee compensation, and selected state tax revenue.

2 Background

West Virginia has two primary natural gas providers and 13 smaller firms that make up the remainder of the market. As of 2016, Mountaineer Gas was the largest provider in the state with more than 216 thousand customers, which was almost 58 percent of the state's customer base (see Figure 2).[1] Mountaineer had approximately $209 million of revenue in 2016. Dominion Energy was the second largest gas company in West Virginia, serving approximately 112 thousand customers, which equated to 30 percent of the state's gas customer base. Dominion Energy had approximately $90 million in revenue in 2016. The remaining gas companies served approximately 43 thousand customers, representing 12 percent of the state's customer base.

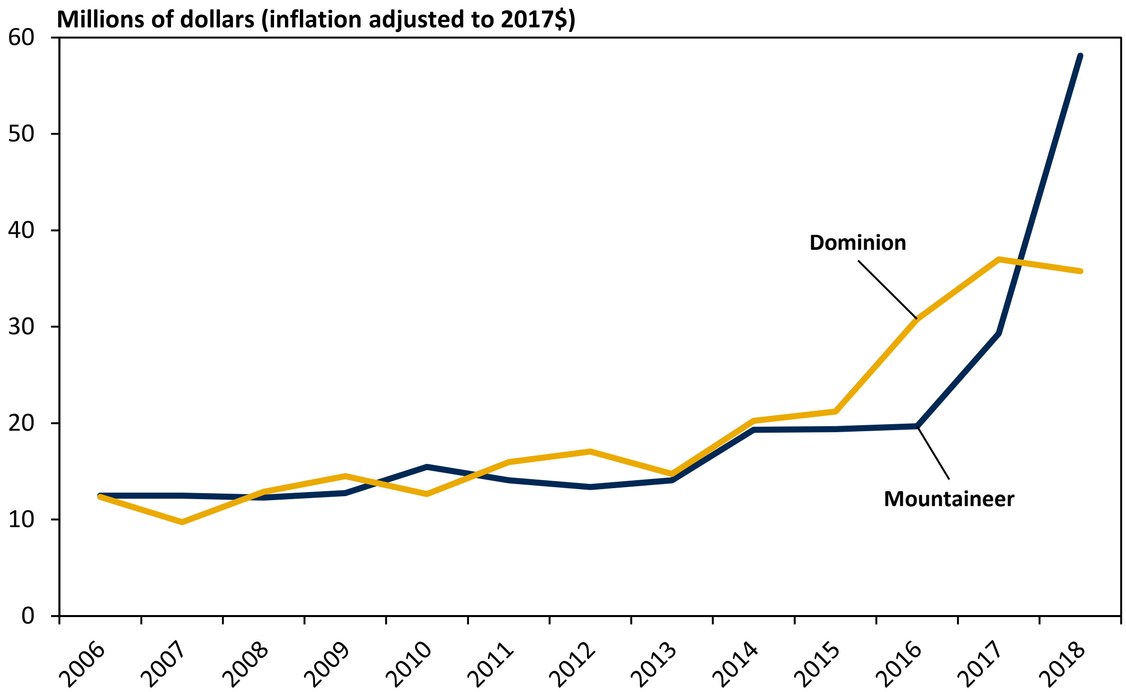
[1] Data from Stalnaker, Kathryn. (2016). "Annual Statistical Report: Statistical Data on Public Utilities in West Virginia." West Virginia Public Service Commission 2016 Annual Report Statistics. http://www.psc.state.wv.us/AnnualStatRpts/default.htm.

Figure 2: WV Gas Company Market Share, 2016



Dominion Energy and Mountaineer Gas have both significantly increased their capital expenditures since 2015 when SB 390 was passed. As shown in Figure 3, capital expenditures at Dominion Energy rose from about $21 million in 2015 to $37 million in 2017, with another $36 million budgeted for 2018. Capital expenditures at Mountaineer Gas rose from about $19 million in 2015 to nearly $59 million budgeted for 2018.

Figure 3: Total Capital Expenditures, 2006-2018



Source: Mountaineer Gas Co., Dominion Energy

3 Methodology

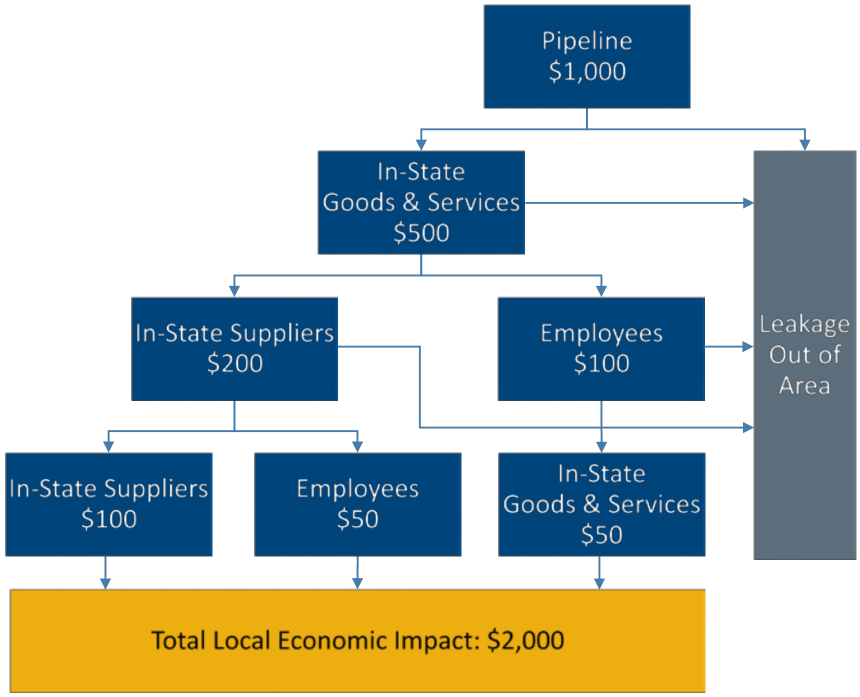
To estimate the economic impact of Dominion Energy and Mountaineer Gas capital expenditures, we use a sophisticated model of the West Virginia economy.[2] The firms' capital expenditures generate new construction activity in the state's economy, which is called the direct impact of the investment activity. However, the impact is not limited to the direct impact, but also includes the secondary economic impact accrued as those expenditures are re-spent through the rest of the economy.

For example, as depicted in Figure 4, during pipeline construction there is an initial expenditure for pipe, land rights, engineering services, etc. As the suppliers of these inputs increase production, their subsequent suppliers will increase production, and so on. Also, the firms will hire workers to build the pipeline, part of whose income will be spent back into the local economy, generating more output, income, and employment impact. These secondary impacts together form what is known as the "multiplier effect." The original stimulus to the economy from the capital investment is re-spent multiple times through the rest of the economy. At each stage some of the expenditures "leak" out of the region as they are spent at companies outside the state. The combined direct impact and secondary impacts together constitute the total economic impact of the construction.

---

[2] This study was conducted using IMPLAN modeling software, an industry-standard input-output model of the economy. More information about IMPLAN can be found at http://www.implan.com.

Figure 4: Economic Impact Flow



To proceed with the analysis, we make two key assumptions. First, in order to estimate the economic impact of capital expenditures, we assume a scenario where these expenditures are eliminated from the local economy, but the relationships between industries in the remainder of the economy is unchanged by the elimination of this spending. This type of analysis is called an economic contribution analysis. Second, we assume that third-party contractors utilized by Dominion Energy and Mountaineer Gas, as well as the firms' employees who perform pipeline construction, live within the state boundaries and spend the majority of their income within the state.

4 Economic Impact of Capital Expenditures

In this section we estimate the economic impact of the capital expenditures from the state's two largest utilities. Data for these estimates was provided by the companies, and were not independently audited by the authors. The companies made available annual capital expenditure data for the period between 2006 and 2018 (budgeted).

4.1 Dominion Energy

Over the previous 13-year period, Dominion Energy spent approximately $255 million[3] in total capital expenditures (see Table 1). Over that period, we estimate this spending supported an average of 137

[3] All dollar amounts in this section have been adjusted for inflation to 2017 dollars.

workers each year in the construction sector for a total direct employment of 1,787 job-years.[4] These workers earned more than $97 million in compensation. We estimate that these expenditures directly supported about $9.7 million in selected tax revenue for state and local governments.[5]

We estimate that these direct expenditures generated almost $126 million in secondary impacts through the 13-year period. When added to the direct impact, the total impact is estimated to be over $380 million. Employment in supply-chain industries are estimated to be 934 job-years, for a total employment impact of more than 2,700 job-years of employment impact. Workers in secondary industries earned a total of $38.7 million in compensation for a total impact of more than $136 million. These expenditures generated about $4.2 million in tax revenue, for a total tax impact of nearly $14 million.

Table 1: Dominion Energy Economic Impact Summary, 2006-2018

	Direct Impact	Indirect & Induced Impact	Total Economic Impact
Output ($, millions)	254.9	125.8	380.7
Employment (job-years*)	1,787	934	2,721
Employee Compensation ($, millions)	97.4	38.7	136.1
Total Taxes† ($, millions)	9.7	4.2	13.9

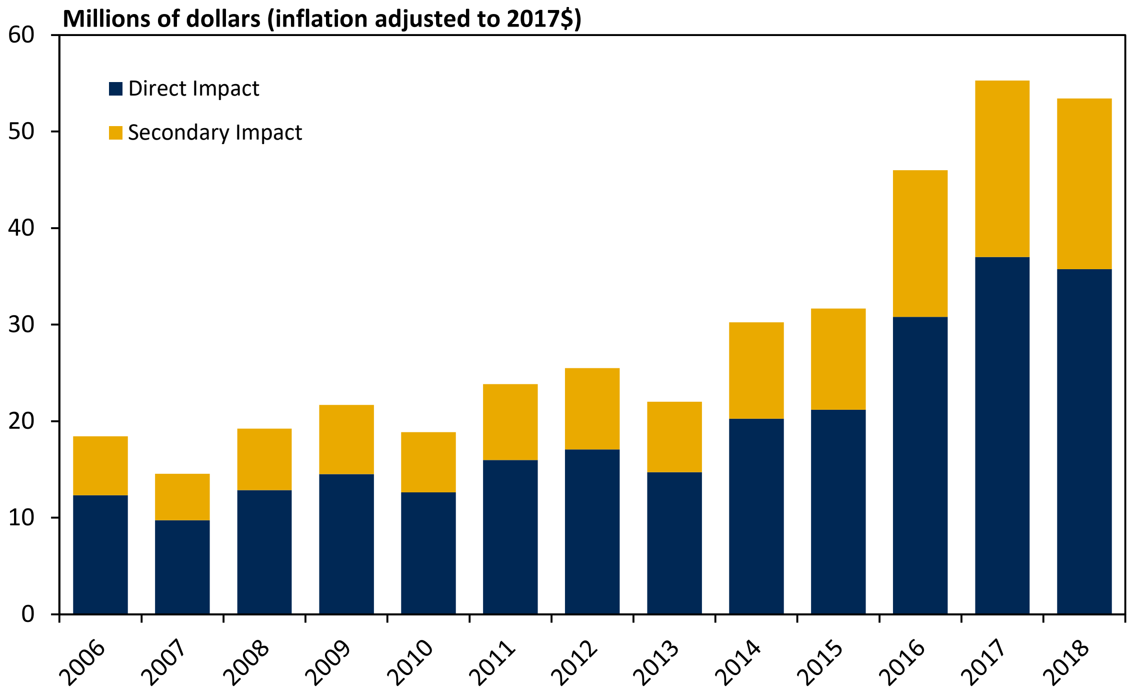
Note: All dollar amounts have been inflation-adjusted to 2017 dollars.
* A job-year is defined as one worker employed for one year.
† Taxes include estimated revenue from personal income, sales, property, and corporation net income taxes.

[4] A job-year is defined as one worker employed for one year.

[5] Taxes include estimated revenue from personal income, sales, property, and corporation net income taxes

In Figure 5, we report our estimates for the economic impact in each year of the study period. Total economic impact stayed consistently under $25 million between 2006 and 2013, with a high point of $25.5 million in 2012. The economic impacts began to rise in 2014 along with direct spending, reaching a high of more than $55 million in 2017 before falling back slightly in 2018 to just over $53 million.

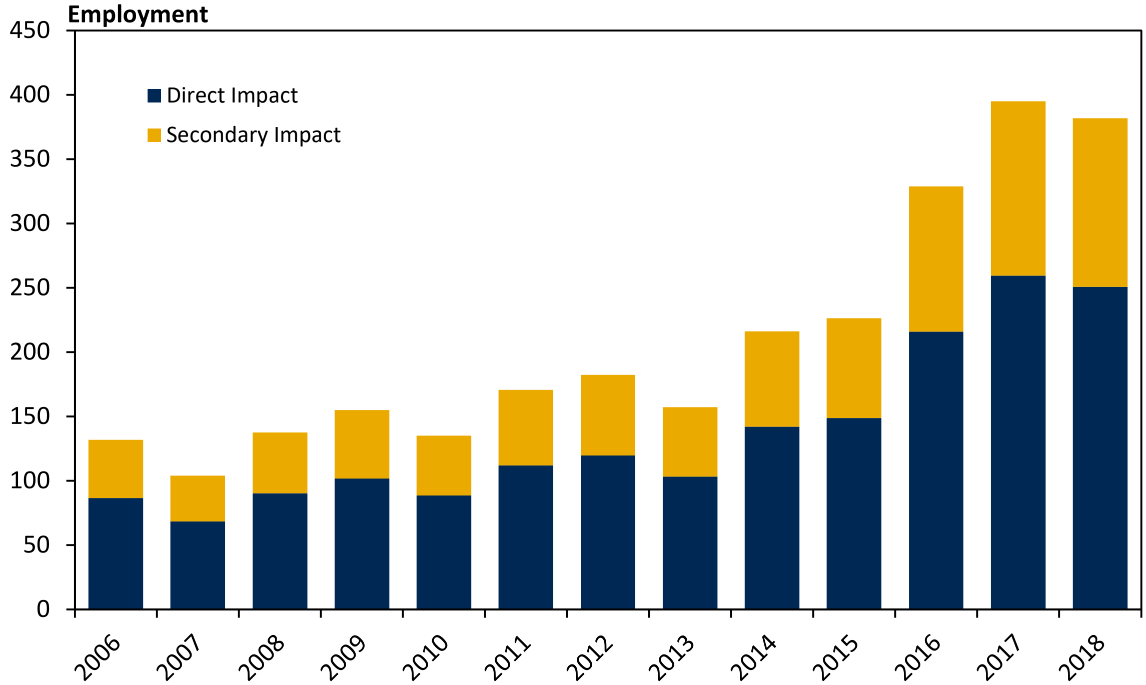
Figure 5: Dominion Energy Capital Expenditure Impact, 2006-2018



Source: Dominion Energy, Author Calculations

Annual employment impacts follow a pattern similar to those found in the output impacts. Secondary employment impacts ranged from a low of 35 jobs in 2007 to a high of 135 jobs in 2017. Total employment impacts were about 60 jobs and lower through 2013, then began to rise, reaching a high of 395 employees in 2017.

Figure 6: Dominion Energy Employment Impact, 2006-2018



Source: Dominion Energy, Author Calculations

4.2 Mountaineer Gas Co.

Mountaineer Gas spent approximately $253 million[6] in total capital expenditures between 2006 and 2018, according to data provided by the company (see Table 2). Over that period, we estimate this spending supported an average of 136 workers each year in the construction sector for a total direct employment of 1,772 job-years, with nearly $97 million in compensation. We estimate that these expenditures directly supported about $9.6 million in selected tax revenue for state and local governments.[7]

We estimate that these direct expenditures generated almost $125 million in secondary impacts through the 13-year period, for a total economic impact of nearly $378 million. Secondary employment is are estimated to be 927 job-years, for a total employment impact of about 2,700 job-years of employment impact. Workers in secondary industries earned a total of $38.4 million in compensation for a total impact of more than $135 million. These expenditures generated about $4.1 million in tax revenue, for a total tax impact of nearly $14 million.

Table 2: Mountaineer Gas Economic Impact Summary, 2006-2018

	Direct Impact	Indirect & Induced Impact	Total Economic Impact
Output ($, millions)	252.8	124.8	377.6
Employment (job-years*)	1,772	927	2,699
Employee Compensation ($, millions)	96.6	38.4	135.0
Total Taxes† ($, millions)	9.6	4.1	13.8

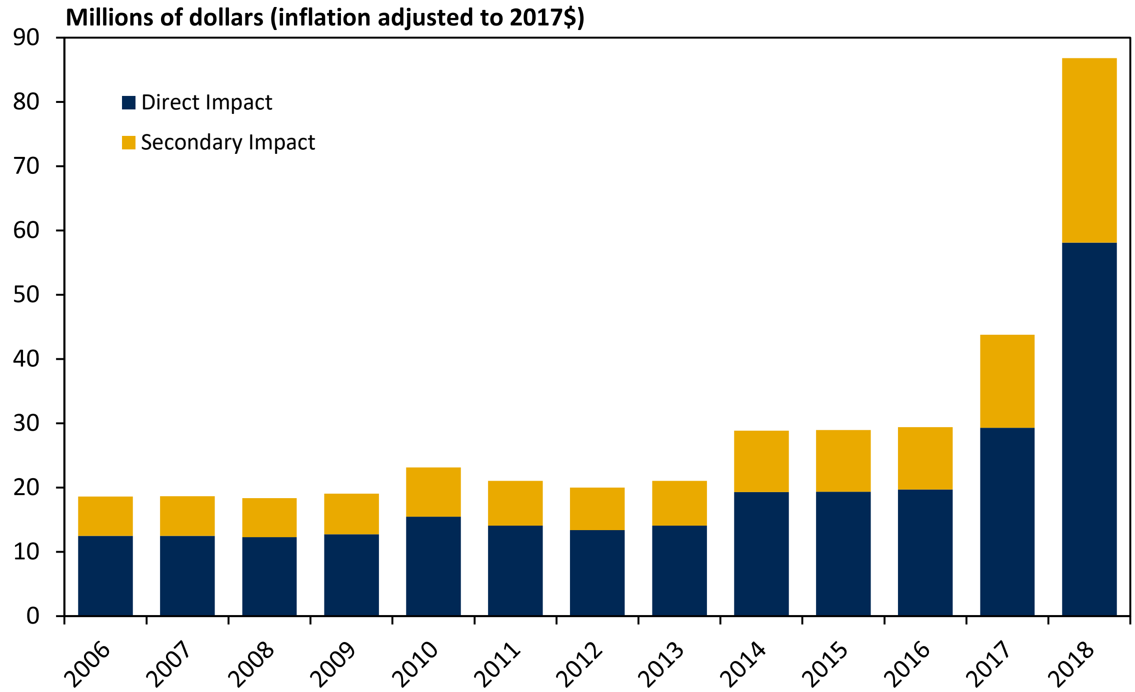
Note: All dollar amounts have been inflation-adjusted to 2017 dollars.
* A job-year is defined as one worker employed for one year.
† Taxes include estimated revenue from personal income, sales, property, and corporation net income taxes.

[6] All dollar amounts in this section have been adjusted for inflation to 2017 dollars.

[7] Taxes include estimated revenue from personal income, sales, property, and corporation net income taxes

Mountaineer Gas' impacts are heavily weighted toward the latter part of the study period (see Figure 7). Total economic impacts hovered between $18 million and $23 million between 2006 and 2013. Impacts began to rise in 2014, reaching nearly $87 million in 2018.

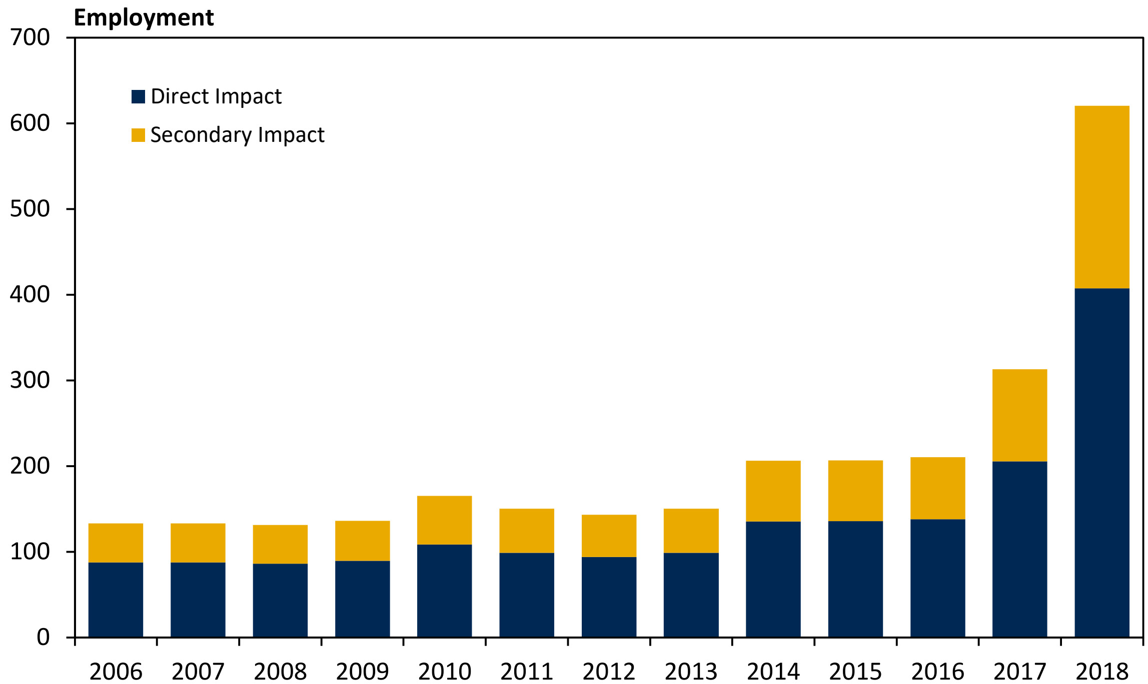
Figure 7: Mountaineer Gas Capital Expenditure Impact, 2006-2018



Source: Mountaineer Gas Co., Author Calculations

We estimate Mountaineer Gas' employment impacts from capital expdnditures to be below 160 jobs between 2006 and 2013. Employment was estimated to be 206 jobs in 2014, rising to more than 620 jobs in 2018.

Figure 8: Mountaineer Gas Employment Impact, 2006-2018



Source: Mountaineer Gas Co., Author Calculations

5 Conclusions

This study examines the economic impact of capital expenditures associated in West Virginia between 2006 and 2018 by the state's two largest natural gas utilities. As shown in Table 3, the companies had a combined $500 million in capital expenditures during this period. When added to secondary impacts, we estimate these expenditures had a total economic contribution to the state of more than $750 million. These expenditures are estimated to support more than 5,400 job-years of employment with $270 million in compensation. These expenditures generated nearly $28 million in tax revenue for state and local governments.

Table 3: Combined Economic Impact Summary, 2006-2018

	Direct Impact	Indirect & Induced Impact	Total Economic Impact
Output ($, millions)	507.6	250.6	758.3
Employment (job-years*)	3,559	1,861	5,420
Employee Compensation ($, millions)	193.9	77.1	271.1
Total Taxes† ($, millions)	19.4	8.3	27.7

Note: All dollar amounts have been inflation-adjusted to 2017 dollars.
* A job-year is defined as one worker employed for one year.
† Taxes include estimated revenue from personal income, sales, property, and corporation net income taxes.

About the Bureau of Business and Economic Research

Since the 1940s, the BBER's mission has been to serve the people of West Virginia by providing the state's business and policymaking communities with reliable data and rigorous applied economic research and analysis that enables the state's leaders to design better business practices and public policies. BBER research is disseminated through policy reports and briefs, through large public forums, and through traditional academic outlets. BBER researchers are widely quoted for their insightful research in state and regional news media. The BBER's research and education/outreach efforts to public- and private-sector leaders are typically sponsored by various government and private-sector organizations.

The BBER has research expertise in the areas of public policy, health economics, energy economics, economic development, economic impact analysis, economic forecasting, tourism and leisure economics, and education policy, among others. The BBER has a full-time staff of three PhD economists and one master's-level economist. This staff is augmented by graduate student research assistants. The BBER also collaborates with affiliated faculty from within the College of Business and Economics as well as from other parts of WVU.

To learn more about our research, please visit our website at http://www.be.wvu.edu/bber.