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FTI CONSULTING

ECONOMIC BENEFITS OF THE MOUNTAIN VALLEY PIPELINE PROJECT IN WEST VIRGINIA

CRITICAL THINKING
AT THE CRITICAL TIME™

DISCLAIMER

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Principal Authors:

Ken Ditzel

Rob Fisher

Kaustuv Chakrabarti

Special thanks to the research and analytical contributions of Drew Ernest and Patricia Hogan

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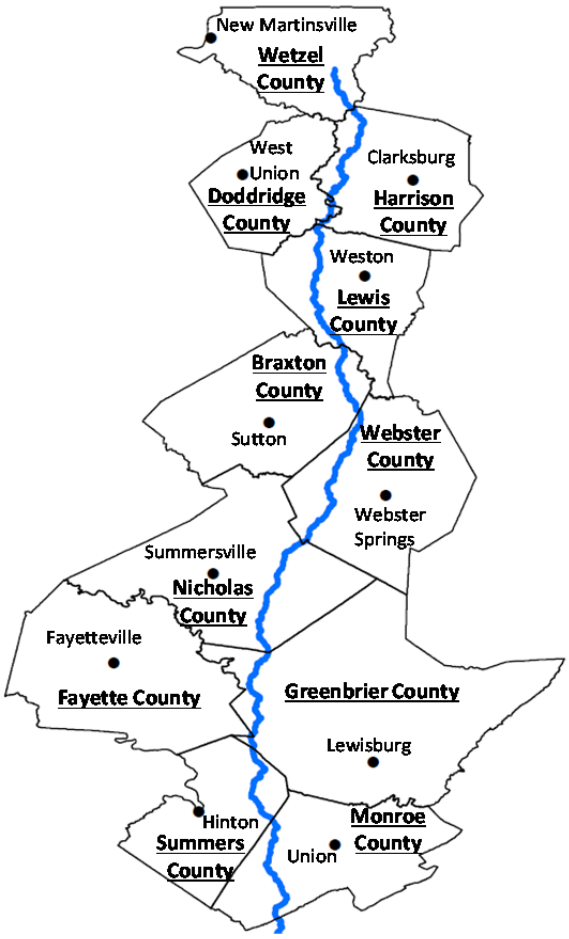
Executive Summary

EQT Corporation retained FTI Consulting ("FTI") to examine the potential economic benefits of the Mountain Valley Pipeline ("MVP") project to the State of West Virginia and the ten eleven counties through which the project is proposed. The MVP is a natural gas pipeline that will traverse approximately 300 miles across West Virginia and Virginia, including the West Virginia counties of Wetzel, Harrison, Doddridge, Lewis, Braxton, Webster, Nicholas, Greenbrier, Fayette, Summers, and Monroe, as shown in Figure 1.

Figure 1 – Proposed MVP Path through West Virginia



Three types of economic benefits would occur from the construction and operation of the MVP project. These benefits include:

- **Construction Spending Benefits:** Expenditures on goods and services in the State would translate into job creation; economic benefits to West Virginia suppliers, their employees, and the overall economy; and new tax revenues.
- **Operational Benefits:** Once in service, the project would require a skilled workforce to operate and maintain the pipeline. Also, it would generate annual property tax revenues for the counties, providing an additional stream of funds.
- **Direct-Use Benefits:** The State and counties would benefit from the potential direct use of gas from the MVP project. The project would enhance gas service already available, help enable new gas service, and expand opportunities for commercial and manufacturing activities.

Construction Spending Benefits

From 2015 to 2018, the MVP project owners plan to spend $811 million directly on resources (equipment, materials, labor, and services) in West Virginia. This direct spending would translate into $594 million in cumulative Gross Regional Product over the four-year period, as summarized in Figure 2.

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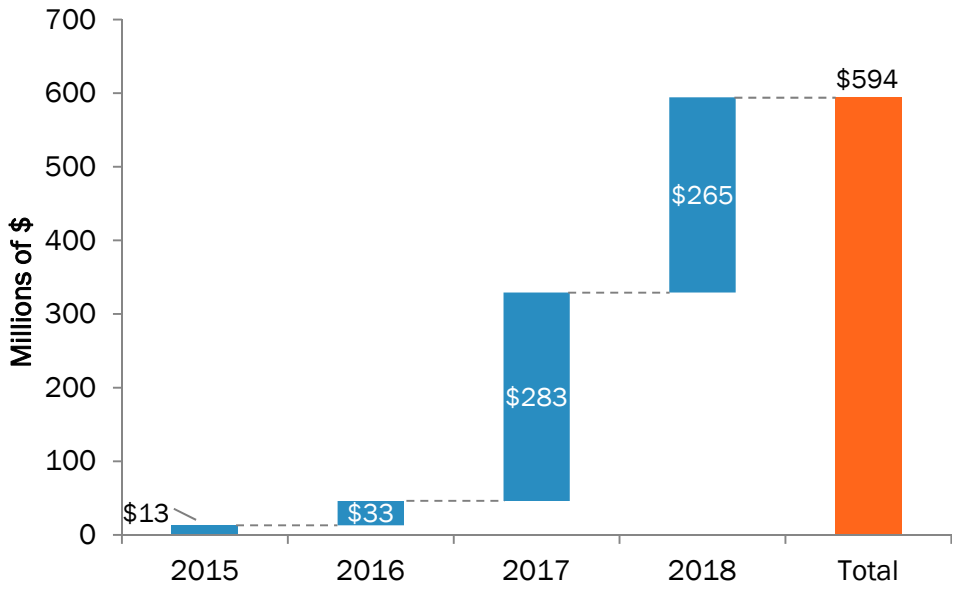
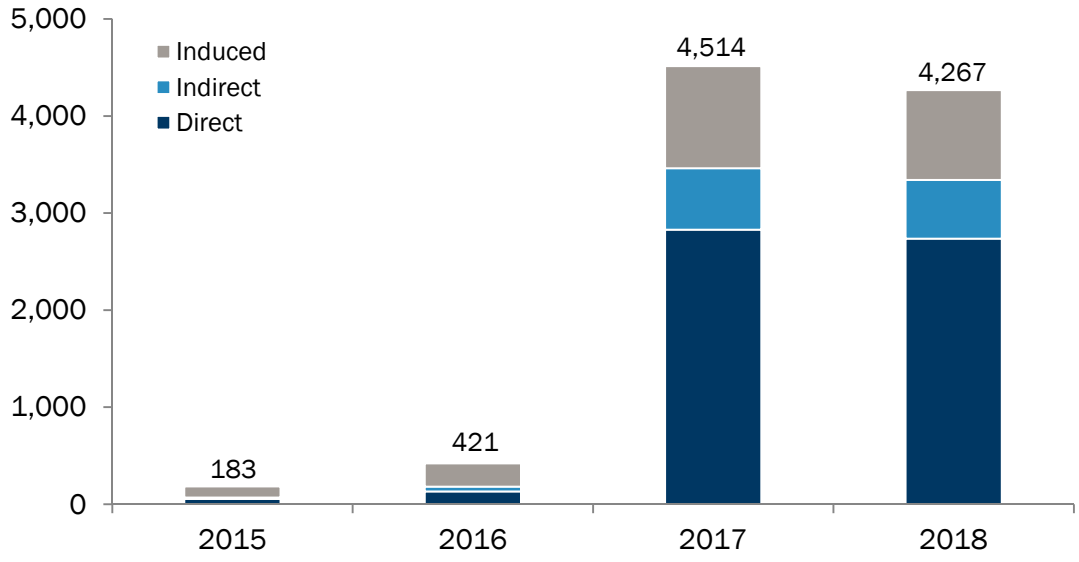
Figure 2 – MVP Additions to West Virginia's Gross Regional Product



The MVP project would create more than 4,500 jobs at the peak of construction in 2017. 2,829 of these jobs would be directly associated with the project (labeled "direct" in Figure 3); 633 jobs would be created along the supply-chain ("indirect"); and 1,052 jobs would be created in the general economy.

Figure 3 – MVP Jobs Created in West Virginia by Year[1]

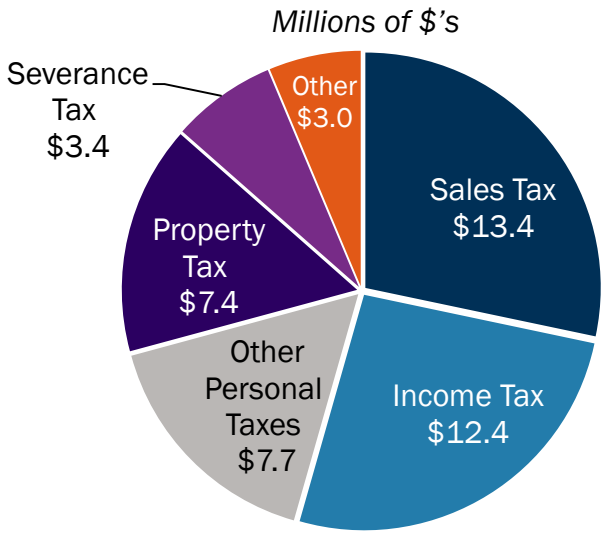


[1] The jobs shown in the figure are annual, full-time equivalent jobs (or job-years) that the MVP project contributes to the West Virginia economy from 2015-2018.

Cumulatively, the MVP project would create 9,384 job-years over the course of construction.

Another benefit of the MVP project is the increased state and local tax revenues that result from the economic ripple effect of construction expenditures. As shown in Figure 4, the project would generate $47 million in aggregate tax revenues from 2015 to 2018.

Figure 4 – West Virginia State and Local Tax Revenues Generated during Construction, 2015–2018



Operational Benefits

Once in service, the MVP project would continue to benefit West Virginia's economy in three main areas. The first is in operational employment and spending. Ongoing operation and maintenance of the pipeline would support a total of 54 jobs across the state with average annual wages and benefits of almost $65,000.

Annual tax revenues through ad valorem taxes (property taxes) represent the second area of operational benefits. Based on the estimated pipeline investments and county property tax rates, the MVP project owners would pay up to $17 million in taxes annually. This amounts to 17% of the total 2013 combined budgets for the eleven counties.

Direct-use benefits of the pipeline's natural gas represent the third area where West Virginia and the counties potentially could benefit from the project and are discussed in further detail below.

Direct-Use Benefits

Residential, Commercial, and Municipal Buildings

In terms of direct gas-use benefits, the MVP project could provide significant fuel cost savings to the residential, commercial, and municipal sectors of Monroe, Summers, and Webster counties through fuel switching (i.e., switching fuels used for space heating and water heating from propane, fuel oil, diesel, and electricity to natural gas). These three counties have limited gas access compared to the

remaining eight counties along the proposed pipeline in West Virginia. The MVP proposed route will pass near the major towns in these counties (see Table 1).

Table 1 – Distance to MVP Proposed Route from Towns and Areas in Monroe, Summers, and Webster Counties

County	Major Towns	Distance from MVP Proposed Route
Monroe	• Union	8.2 mi.
	• Alderson	5.5 mi.
	• Peterstown	5.5 mi.
Summers	• Hinton	7.8 mi.
Webster	• Webster Springs	7.2 mi.
	• Cowen	1.2 mi.

Transportation Sector

The transportation sector in the eleven counties represents the largest opportunity for fuel switching. Conversion of the eleven counties' fleet vehicles such as school buses, sanitary waste vehicles, and county vehicles could result in approximately $500,000 in annual fuel switching savings. This amount includes the full cost of the delivered gas and CNG infrastructure required. Further savings, and thus disposable income, could be realized across the counties if the CNG stations were made available for public consumption. Furthermore, this amount is based on current low fuel prices. Savings would be significant higher if fuel prices were to increase.

Transitioning vehicles to natural gas (i.e., fuel switching) has become an increasing priority in West Virginia. In 2012, the Governor issued an executive order to create a Natural Gas Vehicle Task Force.[2] The State also has provided helpful tax credits to enable compressed natural gas (CNG) vehicle deployment.[3] Using these credits, IGS Energy CNG Services (IGS) constructed and placed into operation three large-scale, public CNG refueling stations along Interstate 79 in the last two years (see Figure

Figure 5 - Locations of IGS's Three CNG Stations Along I-79

[2] *Natural Gas Vehicle Task Force Report*, February 2013.
[3] See http://www.afdc.energy.gov/laws/all?state=WV

5). One of these stations is located in Jane Lew in Lewis County and another in Bridgeport in Harrison County. Braxton County is one of the eleven counties along the proposed MVP route and could be another potential site for a CNG station along the I-79 corridor.

Interstate 64 represents another major corridor for potential CNG refueling stations in West Virginia. The interstate runs from St. Louis, MO, to the Virginia coast, and it intersects with Charleston near the IGS station along I-79. Summers and Greenbrier counties could be worthy candidates for future Interstate 64 CNG stations, especially as they are along the proposed MVP project path.

Future Benefits

The MVP project would provide manufacturing investment opportunities within the state and the counties. FTI interviews with county leaders indicate that natural gas access can be a major factor in businesses deciding to expand and locate operations in a county, particularly energy-intensive and advanced technology manufacturing. These businesses provide large economic benefits to communities from an employment, wage, and tax revenue perspective. Harrison County serves as an example. It has a thriving aerospace services industry in which the average annual wage is $72,000. Harrison County also has an unemployment rate of only 5.2%.

Altogether, the proposed MVP project would provide a number of economic and employment benefits to West Virginia and the counties through which the project is planned. During construction, these benefits would result from capital spent directly within West Virginia and the counties. Once in service, MVP will employ people within the state to help operate and maintain the pipeline. Also, counties will collect property taxes from the pipeline. Finally, the pipeline will provide sizable opportunities for direct gas use in areas with and without gas access. These opportunities include additional supply reliability, fuel switching savings, and new energy-intensive and advanced technology businesses started in West Virginia.

1. Introduction

1.1. Project Background

The proposed MVP project is a FERC-regulated natural gas pipeline system that would span approximately 300 miles from the northern part of West Virginia to the southwestern part of Virginia.[4] It is expected to provide at least two billion cubic feet per day or 3% of current U.S. gas demand to markets in the Mid- and South- Atlantic regions. The pipeline as proposed would pass through eleven West Virginia counties.

EQT Corporation has retained FTI Consulting ("FTI") to examine the MVP project's potential economic benefits along three areas – economic growth and employment resulting from construction expenditures, operational benefits in terms of jobs created and ad valorem taxes paid by the MVP project owners, and direct gas-use opportunities that would result within the counties.

1.2. Approach

Below we summarize the approaches taken for determining the economic benefits in the three areas.

Construction Economic Impacts and Job Creation Benefits

FTI applied the IMPLAN model to estimate the economic impact and jobs created from construction activities in West Virginia. The IMPLAN model is a general input-output modeling software and data system that tracks the movement of money through an economy, looking at linkages between industries along the supply chain, to measure the cumulative effect of spending in terms of job creation, income, production, and taxes. The IMPLAN data sets represent all industries within the regional economy – rather than extrapolating from national averages – and are derived primarily from data collected by federal agencies.[5]

The economic impacts that IMPLAN calculates can be broken into direct impacts, indirect impacts, and induced impacts, defined as follows:

- **Direct impacts:** the economic activity resulting from the MVP capital costs spent on industries residing in West Virginia. These are the industries that provide the 'direct' materials, construction labor, construction management, and technical services (e.g., engineering and

[4] The MVP would be constructed and owned by Mountain Valley Pipeline, LLC, a joint venture of EQT Corporation (NYSE: EQT) and NextEra US Gas Assets, LLC, an indirect, wholly owned subsidiary of NextEra Energy, Inc (NYSE: NEE).
[5] The 2012 IMPLAN Dataset includes data from the U.S. Bureau of Labor Statistics (BLS) Covered Employment and Wages (CEW) program; U.S. Bureau of Economic Analysis (BEA) Regional Economic Information System (REA) program; U.S. BEA Benchmark I/O Accounts of the U.S.; BEA Output estimates; BLS Consumer Expenditure Survey; U.S. Census Bureau County Business Patterns (CBP) Program; U.S. Census Bureau Decennial Census and Population Surveys; U.S. Census Bureau Censuses and Surveys; and U.S. Dept. of Agriculture Census.

design, surveying, and permitting) for the project. This is the first order impact of the MVP expenditures within the state.

- **Indirect impacts:** the economic activity resulting from the 'direct' industries spending a portion of their revenues on goods and services provided by their supply chain in West Virginia. These supply chain industries represent the second order or 'indirect' impacts of the original MVP expenditures in West Virginia.
- **Induced impacts:** the economic activity resulting from the spending of the income earned by employees within the 'directly' and 'indirectly' affected industries. The benefactors of induced impact are primarily consumer-related businesses such as retail stores, restaurants, and personal service industries. These 'induced' impacts represent the third order impact.

Through the direct, indirect, and induced impact calculations, IMPLAN provides the economic ripple effect, or multiplier, that tracks how each dollar of input, or direct spending, cycles through the economy to suppliers and ultimately to households.

The first step of the IMPLAN process was to collect the estimate for state-only spending for each of the major project cost categories. These categories included the following:

- Pipeline Materials
- Compressor materials
- Meters and regulator devices
- Technical services such as engineering design, survey, and permitting
- Construction and commissioning services
- Land and right of way acquisitions

Of the $3.5 billion that the MVP project owners plan to spend, $811 million is planned to be spent *directly* in West Virginia, with the difference being spent in Virginia and outside the two states.

FTI then assigned these cost categories to one of the 440 IMPLAN economic sectors as inputs to the model. The model was then run from 2015 to 2018 to provide the following direct, indirect, and induced economic impacts:

- **Gross Regional Product (GRP):** an industry's value of production over the cost of its purchasing the goods and services required to make its products. GRP includes wages and benefits paid to wage and salary employees and profits earned by self-employed individuals (labor income), monies collected by industry that are not paid into operations (profits, capital consumption allowance, payments for rent, royalties and interest income), and all payments to government (excise taxes, sales taxes, customs duties) with the exception of payroll and income taxes.

- **Employment Contributions:** direct, indirect, and induced annual average jobs for full-time, part-time, and seasonal employees and self-employed workers.

- **State, Local, and Federal Taxes:** payments to government that represent employer collected and paid social security taxes on wages, excise taxes, sales taxes, customs duties, property taxes, severance taxes, personal income taxes, corporate profits taxes, and other taxes.

- **Labor Income:** the wages and benefits paid to wage and salary employees and profits earned by self-employed individuals. Labor income demonstrates a complete picture of the income paid to the entire labor force within the model.

Section 2.1 provides the results of the IMPLAN construction and employment benefits analysis.

Operational Job Creation and Ad Valorem Tax Benefits

The MVP project would create jobs within the state to operate and maintain the pipeline and would generate ad valorem tax (property tax) revenues for the counties along the proposed route. To estimate the job benefits of ongoing operations, FTI collected data from EQT on the annual direct employment required within the state to support the pipeline. We then applied the data within the IMPLAN framework described above to determine the total state-wide direct, indirect, and induced employment numbers and average wages.

For ad valorem taxes, FTI performed an analysis in conjunction with EQT utilizing a combination of gross cost and capitalized income approaches. To arrive at the project's gross cost-basis, FTI and EQT segmented the MVP cost budget into county-level cost budgets by allocating the materials, construction, commissioning, and related services costs for pipeline, meters, and regulators on a per mile basis. We then added in the materials, construction, and commissioning costs for materials specific to a county.[6]

The capitalized income approach was developed by creating a pro-forma financial analysis[7], generating the necessary revenues to set the net present value of the project to zero, and then capitalizing the income stream. The gross cost and capitalized income approaches were given weightings of 40% and 60%, respectively, based on FTI conversations with West Virginia tax officials and tax attorneys. We next determined each county's ad valorem tax revenues by multiplying the weighted average tax basis by the assessment ratio of 60% and then by the county property tax rate.[8] Section 2.2 provides the outcome of the operational benefits of the proposed MVP project.

Direct-Use Benefits

Direct-use benefits represent the third area of economic benefits from the proposed project. These benefits include fuel switching savings (e.g., replacing electricity, propane or fuel oil with gas) across

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[6] The MVP project plans to locate compressor stations in four counties along the proposed route.
[7] The pro-forma was developed using a set of proxy assumptions for operational and maintenance costs, selling, general, and administrative costs, cost of capital, debt/equity ratio, construction and long-term interest rates, and depreciation method and period.
[8] For oil and gas property in West Virginia, only 60% of the property tax rate is applied.

all economic sectors along with commercial and manufacturing expansions enabled by gas supply and access. As part of this assessment, FTI conducted reviewed press statements, conducted interviews with private and public entities in the counties and states, and interviewed local distribution companies and municipal agencies to gauge the fuel switching and manufacturing expansion potential in the counties.

Because eight of the eleven counties assessed in this analysis have gas access in major towns and areas and because the manufacturing sector representation is low in most of the counties, FTI's direct-use benefits analysis is mostly qualitative. The quantitative exception involved estimating the potential savings if municipal and private fleet vehicles in the counties were to switch to natural gas from gasoline and diesel. Based on public sources and interviews with county officials, we were able to approximate the number of fleet vehicles and their annual fuel consumption to develop a fuel savings estimate. We then applied costs for infrastructure development needed to support the fuel switching in order to calculate the net annual savings.

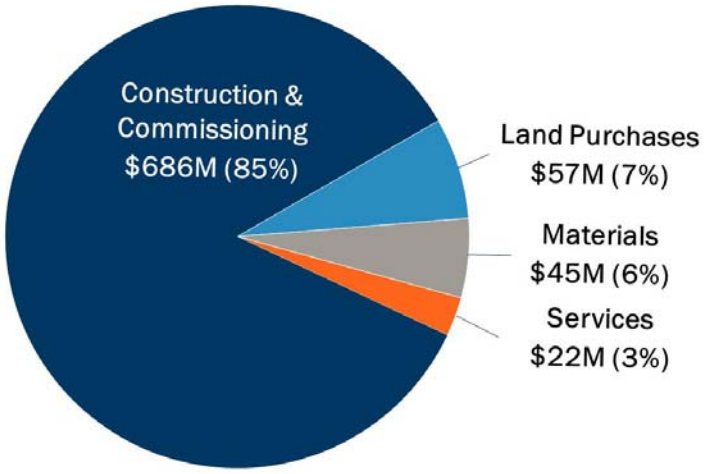
In addition to highlighting the current opportunities for fuel switching, we reviewed the potential for future opportunities that could result from having access to abundant natural gas supplies. We profiled several case studies in West Virginia of future manufacturing expansion potential that could occur with access to the MVP project. Section 2.3 provides the results from the direct-use benefits analysis.

2. Economic Benefits of the Mountain Valley Pipeline

2.1. Construction Economic Impacts and Job Creation

The MVP project owners estimate construction expenditures within the state to be $811 million from 2015 to 2019, and these expenditures would translate into job creation and economic growth for the State and the counties. Figure 6 provides a breakdown of the cumulative MVP expenditures by major spending category in West Virginia.

Figure 6 – MVP Capital Expenditures in West Virginia Construction by Major Spending Category



This spending would result in construction peak year value-added or Gross Regional Product ("GRP") of $283 million in West Virginia. Over the course of the project construction, the project would generate $594 million in cumulative GRP as shown in Figure 7.

Figure 7 – MVP Contributions to Gross Regional Product

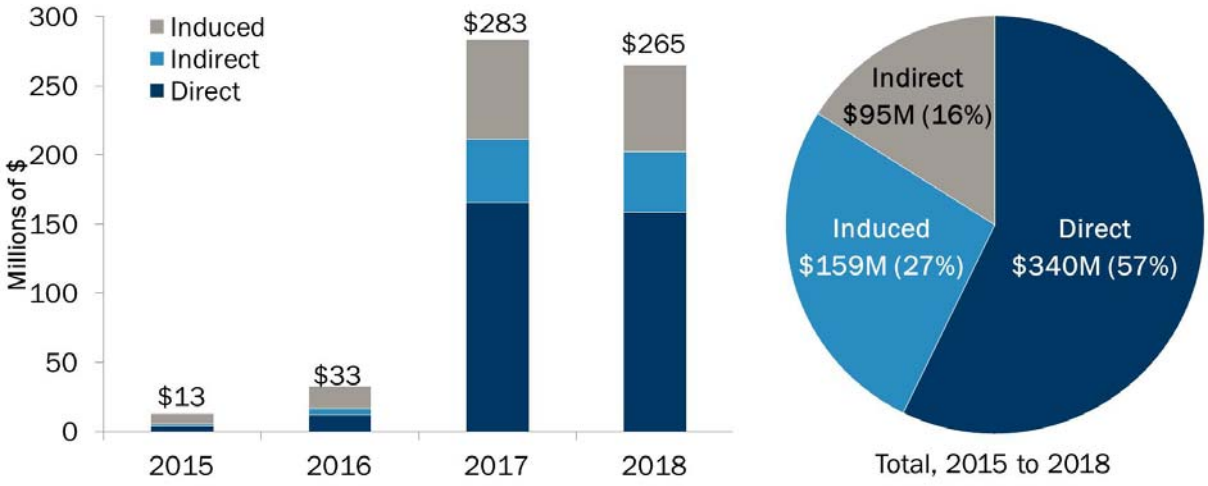
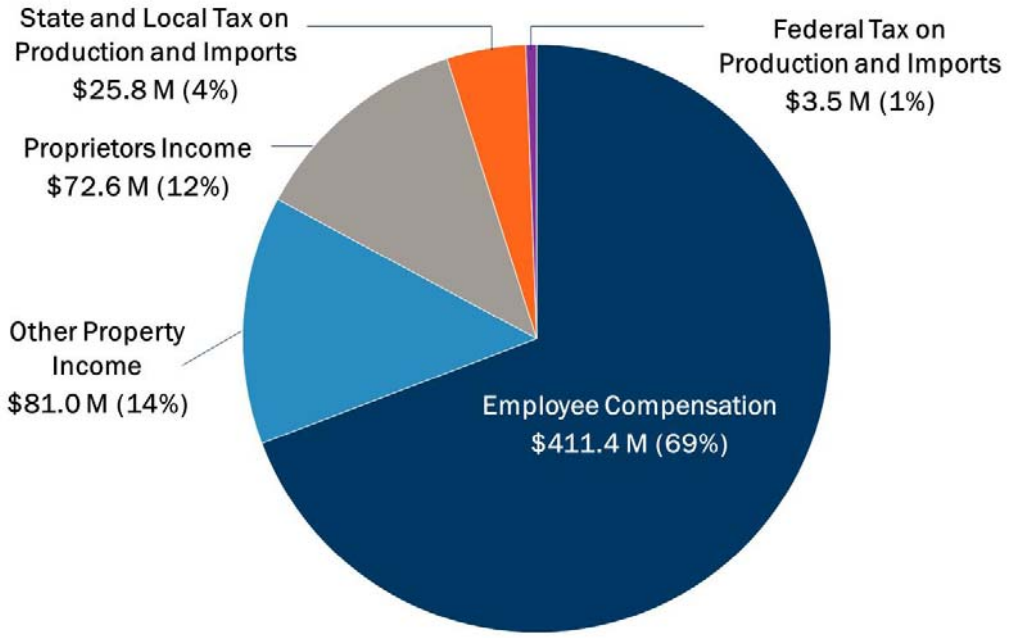


Figure 7 shows GDP segmented into direct, indirect, and induced GRP. As previously mentioned, 'direct' refers to the GRP occurring from the capital expenditures within the industry sectors immediately impacted. 'Indirect' represents the GRP impacts from suppliers to the directly impacted industries. 'Induced' GRP reflects the local spending of employee's wages and salaries of directly and indirectly affected industries.

GRP is defined as the summation of employee compensation, proprietor's income, other property income, and Federal, State, and local taxes on production and imports. Figure 8 shows that $29 million in cumulative Federal, State, and local taxes would be generated from the MVP project construction.

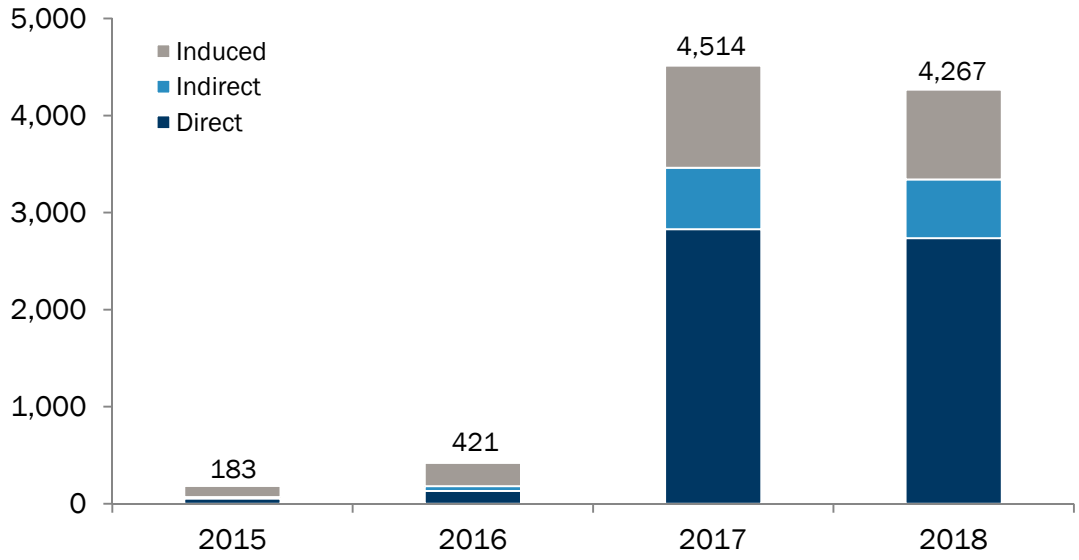
Figure 8 – Composition of MVP's Cumulative Gross Regional Product Contributions



In addition to the GRP benefits, the project will create 4,200 to 4,500 jobs within the state during peak construction activity (2017 and 2018). These jobs include construction jobs, indirect jobs (i.e., jobs created in the state by suppliers to the direct industries impacted), and induced jobs (i.e., jobs created in the state via the spending of construction workers and employees of businesses hired to supply materials and services in constructing the pipeline). Cumulatively, the MVP project would create nearly 9,400 job-years over the course of construction as shown in Figure 9.[9]

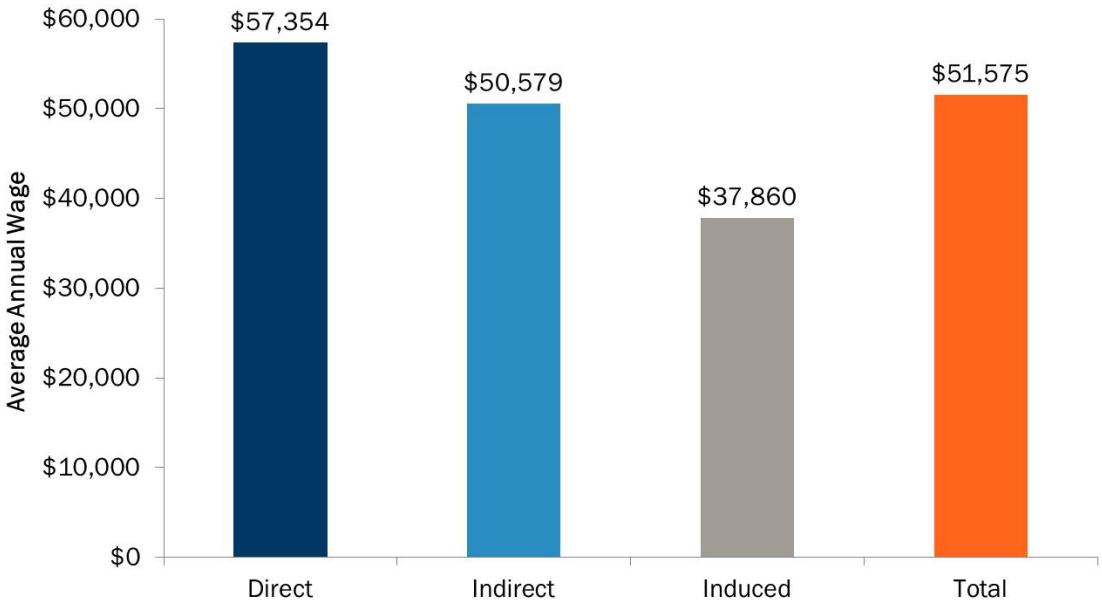
[9] The MVP employment contributions are directly tied to the capital spending in each year and are best expressed in 'job-years'. A job-year is the equivalent of one full-time job lasting a single year.

Figure 9 – MVP Employment Contributions



The MVP employment contribution also would have a positive impact on West Virginia labor income. Figure 10 shows the average labor income per employee for direct, indirect, and induced jobs contributed by the MVP project.

Figure 10 – MVP West Virginia Average Employee Labor Income



2.2. Operational Benefits

The MVP project would contribute employment and generate county property or ad valorem taxes during operation. Once in service, operation and maintenance activities on the pipeline would

support a total of 54 jobs across the state with average annual wages and benefits of almost $65,000 per job contributed.

In terms of property tax benefits, Table 2 shows the estimated ad valorem taxes generated by county once the pipeline is in service and compares these taxes to the counties' general fund budget.

Table 2 – Estimated Annual MVP Ad Valorem Taxes during Operation[10]

County	General Fund Total Revenues	Annual MVP Ad Valorem Taxes	Percent of General Fund Total Revenues
Braxton	$ 4,387,000	$ 1,500,000	34%
Doddridge	$ 5,589,000	$ 470,000	8%
Fayette	$ 11,333,000	$ 840,000	7%
Greenbrier	$ 11,305,000	$ 1,730,000	15%
Harrison	$ 26,631,000	$ 2,120,000	8%
Lewis	$ 10,898,000	$ 1,980,000	18%
Monroe	$ 2,809,000	$ 1,840,000	66%
Nicholas	$ 8,390,000	$ 2,240,000	27%
Summers	$ 3,290,000	$ 890,000	27%
Webster	$ 2,531,000	$ 1,610,000	64%
Wetzel	$ 13,460,000	$ 1,740,000	13%
Total 10 Counties	**$ 100,625,000**	**$ 16,980,000**	**17%**

Source: West Virginia State Auditors Office; FTI and EQT Calculations

In total, the ad valorem taxes generated during operation could represent up to 17% of the general fund revenues among all eleven West Virginia counties. In Monroe and Webster counties, the ad valorem taxes could represent approximately two-thirds of the general fund revenues.

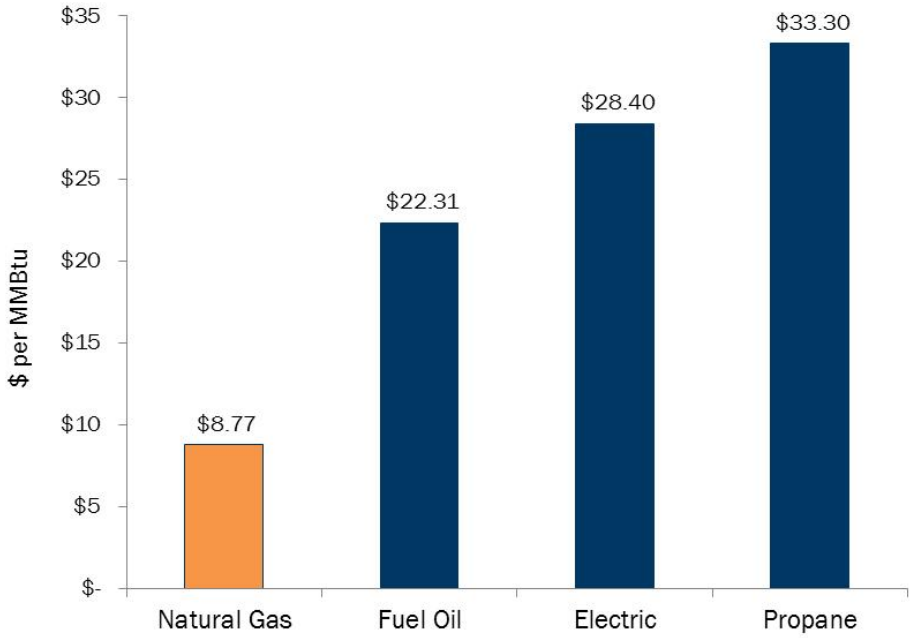
[10] Dollars have been rounded to the nearest $1,000. General Fund figures reflect the latest data available at https://www.wvsao.gov/LocalGovernment/ConBud_14-15.aspx

2.3. Direct-Use Benefits – Existing Opportunities

The shale gas revolution has helped lower natural gas prices almost 60% since 2008, which in turn has created a number of opportunities for greater investment, job creation and economic growth throughout the U.S. economy. Shale also has increased supply of natural gas, which has led to more price stability.

In West Virginia, natural gas prices have been more than 50% lower than other primary fuel sources as shown in Figure 11, making natural gas an economically attractive alternative to the residential, commercial, and municipal sectors.

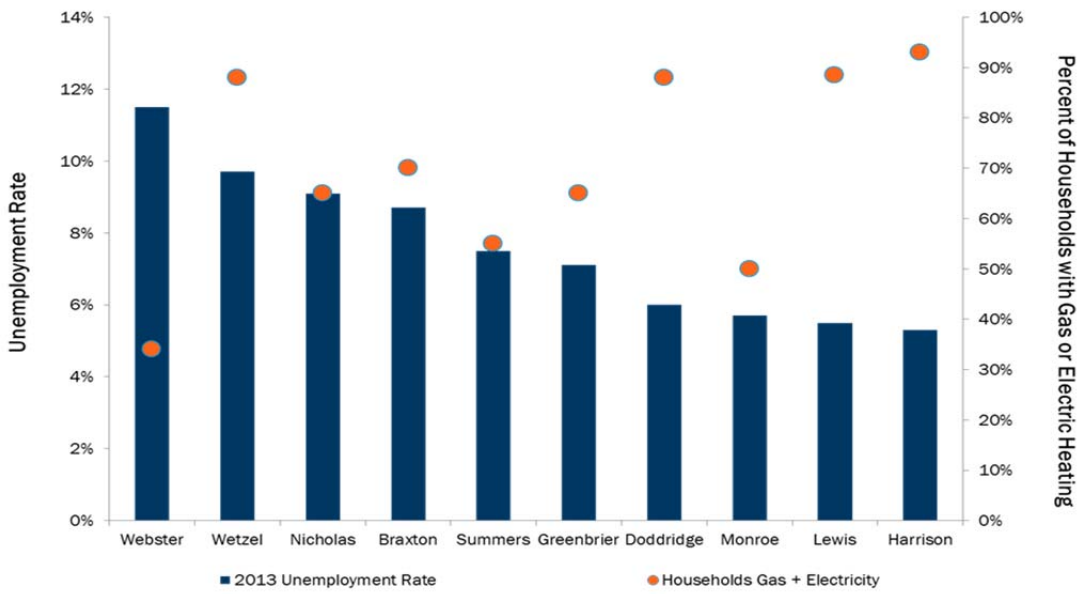
Figure 11 – 2014 Average Residential Winter Fuel Costs in West Virginia[11]



The benefits of natural gas access go beyond consumer fuel cost savings. Natural gas Infrastructure is vital to the overall health of a local economy. For example, Figure 12 shows the unemployment rates in the eleven counties versus the percentage of households using natural gas or electric for space heating. While there are many factors involved in the health of a local economy, the general trend shows that infrastructure access can be correlated to economic performance.

[11] Used EIA residential prices for fuel oil and propane; used average Monongahela Power Co. residential price from EIA for electricity; used Dominion Hope industrial tariff for natural gas.

Figure 12 – Unemployment by County vs. Percent of Households Using Natural Gas or Electricity for Space Heating



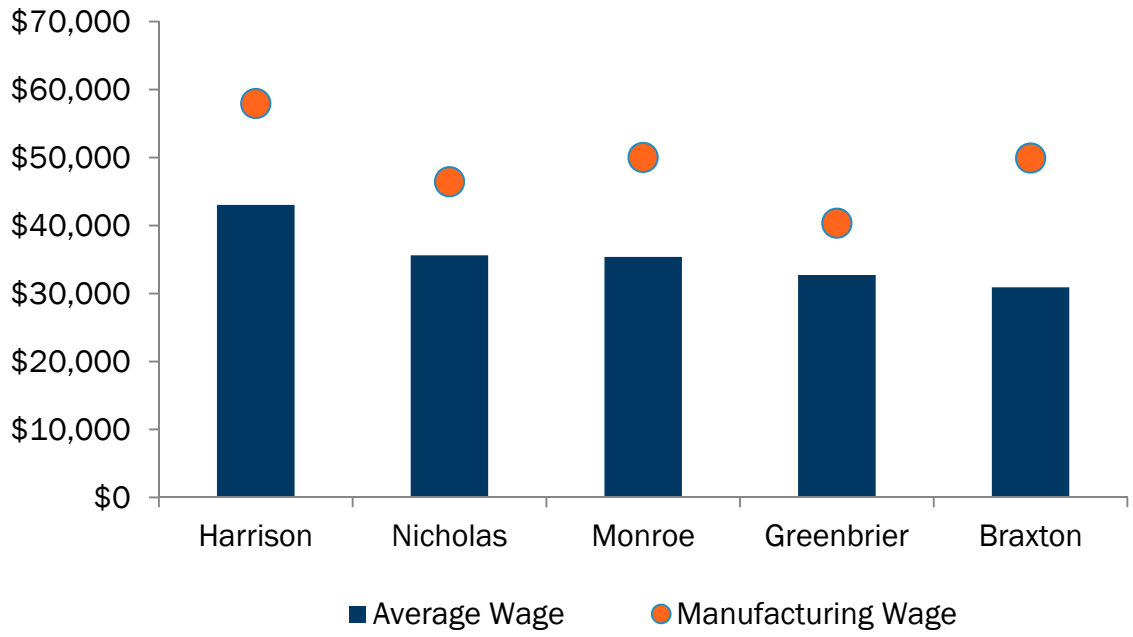
This is economic common sense – counties with extensive infrastructure access (rail, water, electricity, natural gas, interstates, broadband, etc.) are simply provided more opportunities to grow their economy. The contrast between Harrison and Webster counties – two counties along the proposed route – illustrates this point as highlighted in Table 3.

Table 3 – Comparison of Harrison and Webster County Economic Performance

		Harrison	Webster
Infrastructure Access	Electric utility	County-wide	County-wide
	Gas access	79% of households	1% of households
	Water utility	All major towns	Limited to 8 mi. stretch along Rt. 20
	Interstate transport	I-79	N/A
	Rail transport	Clarksburg, Wallace, Shinnston, Bridgeport	Cowen
	Broadband	All major towns	Very limited
Economic Metrics	GDP per Capita (2014)	$61,000	$33,000
	Average Annual Wage (2013)	$43,036	$37,199
	Unemployment Rate (2014)	5.2%	11.3%

Infrastructure capacity and access also present opportunities for higher wages. As shown Figure 13, counties with energy-intensive and advanced technology manufacturing offer a significantly higher wage relative to other sectors. Manufacturing is an important growth engine to a community because manufacturing produces a multiplier effect by providing employees with more disposable income relative to other sectors as well as promoting growth in other industries that support manufacturing as part of the supply chain. Natural gas access also is important to retaining existing manufacturers who are searching for ways to reduce costs given natural gas' attractive costs relative to electricity, propane, and fuel oil.

Figure 13 – Employee Wage Comparison in Counties with Energy Intensive and Advanced Technology Manufacturing



In this section we review fuel switching and business expansion opportunities as they relate to the eleven counties along the proposed MVP route.

2.3.1. Fuel Switching Opportunities

Natural gas access is abundant in many parts of West Virginia due to the state's long history of natural gas production. Eight of the eleven counties along the proposed MVP route have natural gas access in the major towns and areas. The MVP project could provide additional access and reliability to the residential, commercial, and municipal customers in these counties.

Three counties with limited gas access along the proposed route – Monroe, Summers, and Webster – could benefit significantly from the MVP project if they were to switch a sizable portion of their residential, commercial, and municipal energy users over to natural gas. Table 4 provides the location of the MVP project relative to major towns and other natural gas pipelines in these counties.

Table 4 – MVP Proximity to Major Towns and Other Pipelines in Counties with Limited Natural Gas Access

County	Proximity to Major Towns	Major Pipelines Intersecting MVP
Monroe	• Union – 8.2 mi. • Alderson – 5.5 mi. • Peterstown – 5.5 mi.	Columbia Gas
Summers	• Hinton – 7.8 mi.	Columbia Gas
Webster	• Webster Springs – 7.2 mi. • Cowen – 1.2 mi.	N/A

Below we discuss the fuel switching potential for each of these counties in further detail.

Monroe County

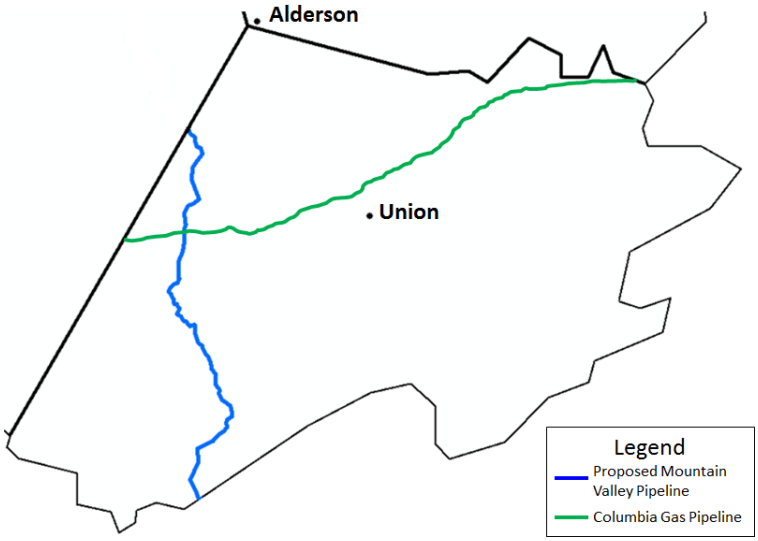
Monroe County is a 474 square-mile county located in West Virginia with a population of 13,483. It is primarily a farming county, with a mix of livestock (cattle, dairy, and sheep) and crop farming (hay, corn, oats, wheat, and tobacco). Timber is also a major contributor to the economy.[12] Monroe County's nominal GDP in 2014 was $190 million or $14,107 per person.[13] The county's economy has grown below the national average (-1.2% vs. 2.4%), but its unemployment has remained low relative to West Virginia and the national average (5.6% vs. 6.5% in West Virginia and 6.2% nationally)

Union is the county seat and has a population of 565, Alderson, which is 40 miles from Union, is the largest town with a population of 1,184. Peterstown, 25 miles from Union, has a population of 653. Together these three towns represent 18% of the county's population.

In Monroe County, the MVP project would provide a vital north-south corridor as the Columbia Gas pipeline runs east-west (see Figure 14).

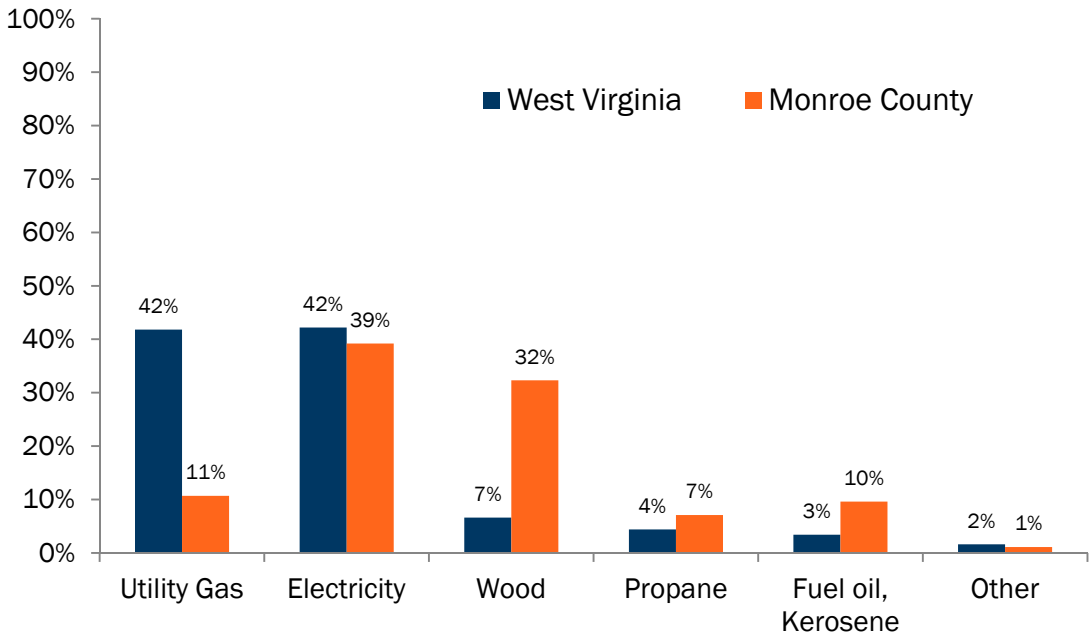
[12] http://www.wvencyclopedia.org/articles/2024
[13] National Association of Counties. http://www.uscounties.forg/countyTracker/index.html

Figure 14 – Monroe County Pipelines – Existing and Proposed



The MVP project could offer fuel switching access opportunities to residential, commercial, municipal, and manufacturing customers in Monroe County. On the residential side, a relatively small percentage (11%) of homes in the county is heated with natural gas (see Figure 15). Commercial and municipal gas usage typically follows suit as gas consumption typically is driven by accessibility.

Figure 15 – Primary Space Heating Fuel Used in Monroe County versus the State, Percentage of Housing Units[14]



[14] 2013 US Census Bureau 5 Year American Community Survey

There are two specific municipal opportunities in the county. Two schools located in Peterstown are heated using electricity that could be switched to gas.

The MVP project also could provide additional access to existing manufacturers if connected to the Columbia Gas pipeline. Below are the two main manufacturers in the county:

- **UTC Corporation:** UTC, formerly Goodrich, is a global supplier of systems and services for the aerospace and defense industries. The company employs 400 people at its Sensors and Integrated Systems plant in Union, WV. The facility is 140,000 square feet, and it is powered by a combination of electricity and natural gas.

- **M-Rock:** The company is a stone and brick designer and manufacturer in Peterstown, WV, and employs 25 people and has annual revenue of $1M.

Summers

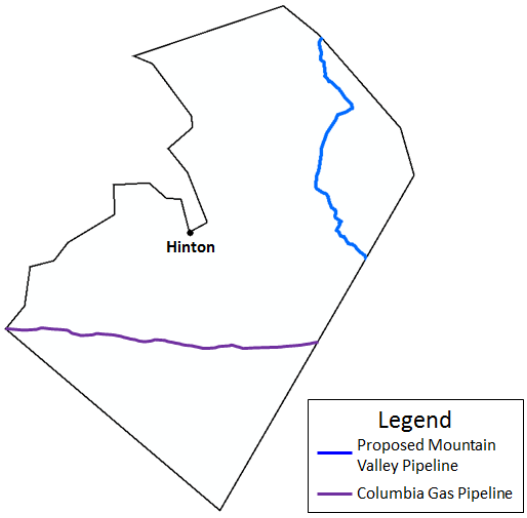
Summers County is a 368 square-mile county located in south-east West Virginia with a population of approximately 13,500 and has a household count of approximately 5,500. Summers County's economy has had challenges. Its nominal GDP in 2014 was $221 million or $16,316 per person.[15] The real GDP shrunk by 1.9% from 2013 to 2014[16] compared to the U.S. GDP real growth of 2.4%[17] during the same time period. Additionally, the county unemployment rate was 7.4% in 2014, compared to 6.5% in West Virginia and 6.2% nationally.

Hinton is the county seat and largest city with a population of 2,676 and represents 20% of the county population. Hinton has gas access.

Like Monroe County, Summers County has the Columbia Gas pipeline running east-west through the county, and the MVP project would provide a vital north-south natural gas corridor (see Figure 16).

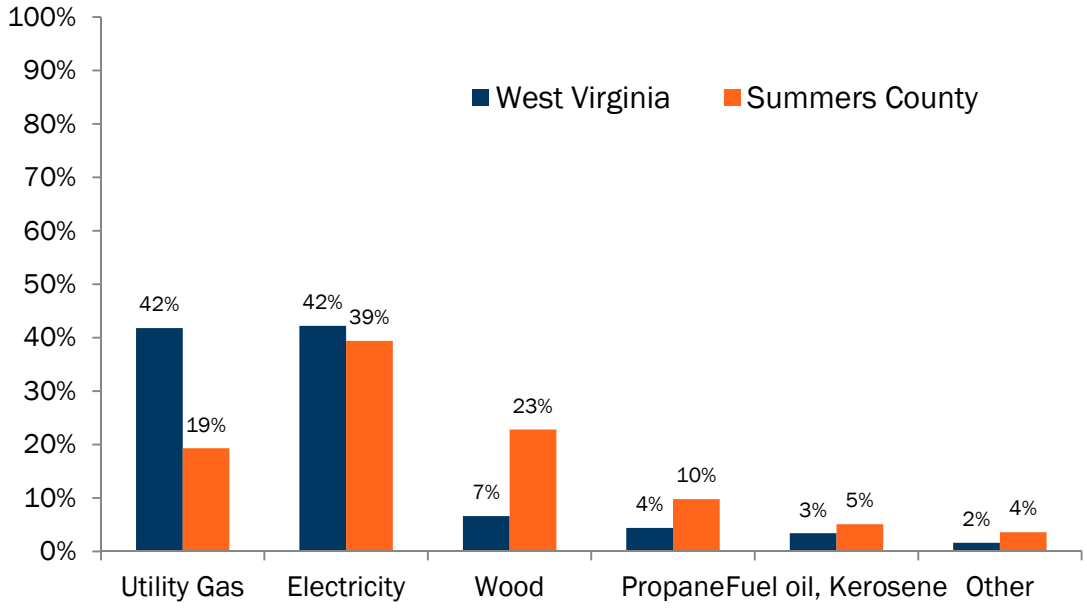
[15] National Association of Counties. http://www.uscounties.org/countyTracker/index.html
[16] National Association of Counties. http://www.uscounties.org/countyTracker/index.html
[17] http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm; file "gdp2q15_2nd.xls" Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.

Figure 16 – Summers County Natural Gas Pipeline Map



The MVP project could offer fuel switching opportunities across all economic sectors. On the residential side, a relatively small percentage (19%) of homes in Summers County is heated with natural gas (see Figure 17). These are mainly homes in Hinton. Commercial and municipal natural gas customers have access in Hinton as natural gas consumption typically is driven by accessibility.

Figure 17 – Primary Space Heating Fuel Used in Summers County versus the State, Percentage of Housing Units[18]



[18] 2013 US Census Bureau 5 Year American Community Survey

The planned route of the MVP pipeline would run through the northeastern portion of Summers County. The route would be near Alderson (5.5 miles away), which is just outside the county on the border of Monroe and Greenbrier counties. Alderson is an important economic center for this portion of Summers County. As such, the community in Summers County area near Alderson could benefit from having gas access for fuel switching purposes.

Webster

Webster County is a 556 square-mile county located in the center of West Virginia. It has a population of approximately 8,900 and has a household count of approximately 4,000. The county's economy has had some challenges. Its nominal GDP in 2014 was $294 million or $33,000 per person.[19] While the county's GDP grew by 2.8% from 2013 to 2014[20] compared to the U.S. GDP real growth of 2.4%[21] during the same time period, the county's unemployment rate has been high – 11.3% in 2014 compared to 6.5% in West Virginia and 6.2% nationally.

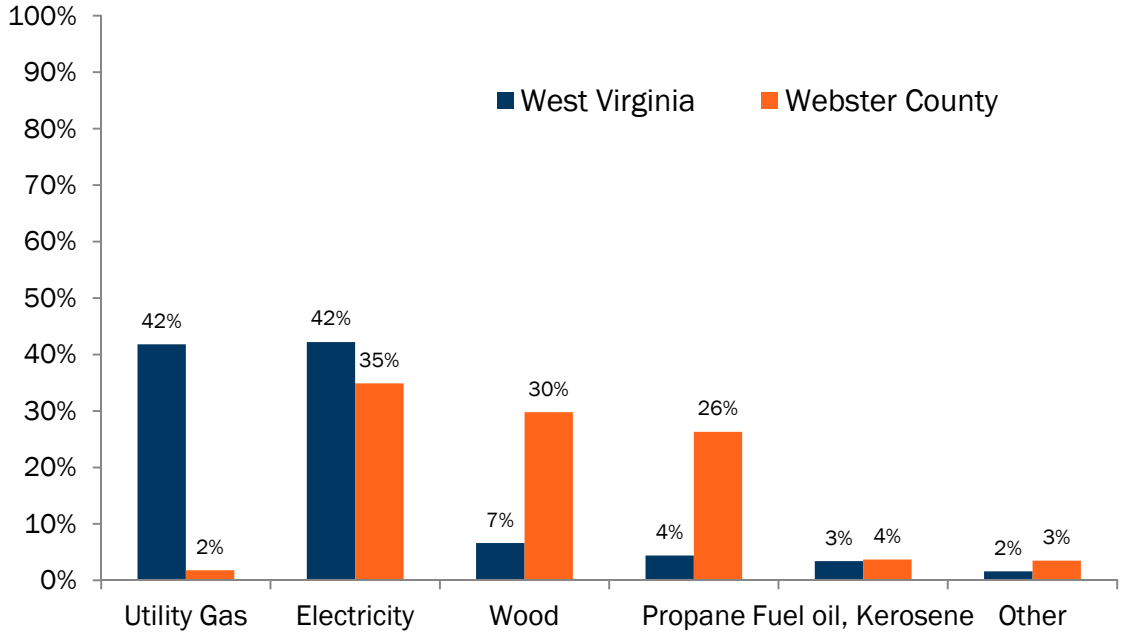
Webster Springs is the largest town with a population of 776 and is also the county seat. Cowen is the second largest town in the county with a population of 541. Together these towns represent approximately 15% of the county's population.

Overall, the economic development in the county has been scattered mainly due to a lack of infrastructure. There is no major interstate that runs through the county. As such, infrastructure is primarily available along the Route 20 corridor, which runs from Camden-on-Gauley in the southern part of the county through, Cowen, Webster Springs, nearby Diana, and Cleveland on the northern part of the county.

Currently there is no gas service in the county. Electricity, wood, and propane are the main residential home heating sources for the county as shown in Figure 18.

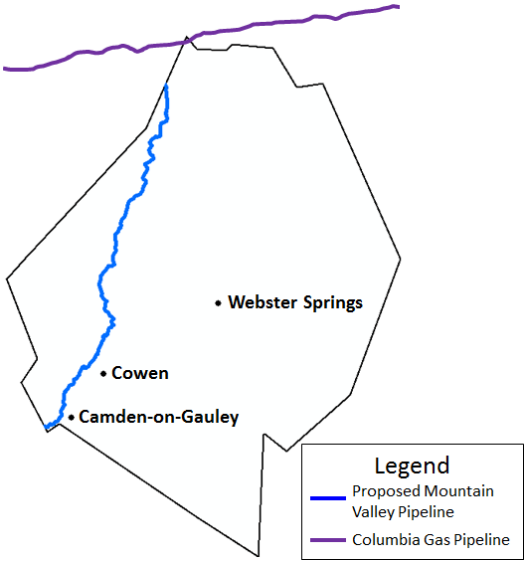
[19] National Association of Counties. http://www.uscounties.org/countyTracker/index.html
[20] National Association of Counties. http://www.uscounties.org/countyTracker/index.html
[21] http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm; file "gdp2q15_2nd.xls" Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.

Figure 18 - Primary Space Heating Fuel Used in Webster County versus the State, Percentage of Housing Units[22]



The residential, commercial, and municipal sectors, particularly in Cowen and Camden-on-Gauly, could benefit from the MVP pipeline as it would run through the western part of the county as shown in Figure 19.

Figure 19 – Webster County Natural Gas Pipeline Map



[22] 2013 US Census Bureau 5 Year American Community Survey

Within Webster County, Cowen represents the best opportunity for fuel switching as the MVP project would run within 1.2 miles of the town. Cowen has a population of 541, and it does not have gas access. Furthermore, Cowen offers the best opportunities for business expansion due to its flat terrain and rail access.

2.3.2. Business Expansion Opportunities

A major natural gas pipeline, such as the proposed MVP project, can draw new businesses that require high volumes of natural gas, particularly energy-intensive and advanced technology manufacturers. These businesses can provide large economic benefits to communities from an employment, wage, and tax revenue perspective as their multiplier effects (the amount of indirect and induced GRP and employment created per dollar of investment) is large. For example, for each job created within the petrochemical industry 12 other jobs are created along the supply chain and from general economic spending.[23] The multiplier or ripple effects for the petrochemical industry are large because the industry has an above average capital investment to direct employment ratio.

In this section we discuss existing, business expansion opportunities in select counties along the proposed MVP route. These opportunities mainly center on West Virginia's gas sector as a number of counties along the proposed route have sizable natural gas operations. The MVP pipeline offers an opportunity for developers to move their natural gas via the pipeline to ten other counties in West Virginia, six counties in Virginia, and a large portion of the U.S. Southeast

Doddridge

The primary growth sector for Doddridge County in recent years has been the oil and gas sector. Mark West in 2013 opened a new gas processing facility outside West Union that employs approximately 25 people. The company plans to triple its capacity in the near future. During the construction of the facility, Mark West employed about 200 local electricians, pipefitters, welders, carpenters and other tradespeople.[24] The Mark West facility, along with other parts of natural gas industry, provides on average wages that are 2.5 times higher than the county average as shown in Table 5 in the Resources and Mining sector.

[23] IMPLAN, 2012
[24] http://www.wvillustrated.com/story/20280391/new-markwest-natural-gas-processing-online-in-doddridge-co

Table 5 – Annual Average Wages in Doddridge County by Sector[25]

Sector	Average Annual Wage
Resources and Mining	$104,946
Construction	$40,780
Government	$32,216
Commercial	$25,549
Manufacturing	N/A
Weighted Average	**$39,016**

Table 5 illustrates that the natural gas industry is an important near-term driver for Doddridge County's economic performance.

Lewis

Existing manufacturing expansion opportunities in Lewis County are limited. Viking Pools, which manufactures hot tubs, spas and whirlpool baths, and Tamarack Log Homes, which manufactures log homes, are large employers but likely have few needs for additional gas supplies. Both are located at the industrial park near the Jane Lew exit of I-79.

The primary growth sector for Lewis County in recent years has been the natural gas industry. The county has become an operational hub for many companies involved in Marcellus Shale development. Companies such as Nexus Drilling, Chesapeake Energy, and Superior Well Services have expanded operations significantly, employing approximately 1,500 people or 20% of the workforce in the county. The average wage for oil and gas extraction employees in Lewis County has been ~$77,300. It is worth noting that Lewis County now has the third lowest unemployment in the state after Monongalia and Jefferson counties.

This boon has been helpful in offsetting manufacturing decline. In 2013 Halliburton shut down their cement plant operations in Weston, WV, and moved it 150 miles away to Zanesville, OH. The company had employed approximately 75 people.

Wetzel

The primary growth sector for Lewis County in recent years has been the oil and gas sub-sector under Resources and Mining. The drilling activity in Wetzel has led to a boom in government revenue with a large increase in tax revenue. Local property tax revenue has nearly tripled since 2005 with

[25] Workforce WV. http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html

significant increases to severance tax revenue as well.[26] The average wage for oil and gas extraction employees in Wetzel County has been ~$73,800.

FTI has found that gas development represents the near-term economic growth opportunity for the county. Wetzel County could benefit further from natural developments in the county by training more county residents to work in the field and exploring approaches for transitioning out-of-state workers to be re-located within the county. This would provide additional disposable income within the counties borders.

2.4. Direct-Use Benefits – Future Opportunities

The shale gas revolution in the last few years has created a manufacturing renaissance in the United States. The increased supply of natural gas has stabilized prices leading to greater investment, job creation and economic growth. Manufacturing is an important growth engine to a community because manufacturing produces a multiplier effect that promotes growth in other industries.

Our interviews with county representatives, regional partnership leaders, and manufacturers inside and outside the county identified that businesses value abundant and reliable gas service, and that access to natural gas is a primary criterion for determining where to locate new manufacturing facilities. Anecdotal evidence from these interviews place lost manufacturing opportunities at 50% for counties without gas access. Clearly, access to a pipeline could have considerable impacts on the local economy in terms of jobs, economic output, and tax revenues.

Below we highlight the major manufacturing employers in eight of the eleven counties along the proposed route. Additional gas access to these manufacturers could help enable expansions by providing a low-cost resource to their operations.

[26] http://www.wvpolicy.org/wp-content/uploads/2014/04/Impacts-of-Drilling-in-Wetzel-County.pdf

Table 6 – Major Manufacturing and Oil & Gas Employers by County

County	Major Manufacturing and Oil & Gas Employers	Products	Est. Employees
Braxton	Weyerhaeuser	Oriented strand board	140
	Appalachian Timber Services	Rail ties	80
	Braxton Lumber	Lumber Mill	20
Doddridge	Mark West	Natural Gas Processing	
Greenbrier	ABB	Industrial motors	160
	Mullican Flooring	Hardwood flooring	120
Harrison	Aurora Flight Services	Aerospace vehicles	160
	Bombardier Services	Airline maintenance	400
	Europtec	Glass fabrication	60
	Graftech	Graphite products	175
	Pratt & Whitney	Airline repair/engine manufacturing	400
	Stockmeier Urethanes	Chemicals products	15
Lewis	Viking Pools	Bathtub and spas	75
	Tamarack Log Homes	Log homes	7
Monroe	UTC Aerospace Systems	Aerospace products	400
	M-Rock	Stone/brick design	25
Nicholas	B/E Aerospace	Aircraft cabin products	160
	Columbia Wood Products	Hardwood products	380
Webster	Allegheny Wood Products	Hardwood products	175
	Jim C. Hamer Company	Hardwood products	75
	Northwest Hardwoods	Hardwood products	

Beyond these existing manufacturers, new manufacturers could emerge with the development of the MVP project. The Marcellus and Utica shale gas formations have created a number of manufacturing opportunities for West Virginia, Pennsylvania, and Ohio. Together, these two gas formations account for 16.6 Bcf/d or more than 20% of U.S. production[27] and are enticing companies to build massive chemical projects in these states. Several projects to build ethane crackers are being considered, and the MVP project along with other oil and gas infrastructure project may attract these and similar manufacturing investments to West Virginia, spurring economic growth, high-paying jobs, and additional tax revenues for the counties and State.

[27] EIA Drilling Productivity Report, October 14, 2014.

Below we present four case studies on proposed projects that, if built, would have significant economic benefits to West Virginia and surrounding areas.

1. Odebrecht

Odebrecht is a Brazilian conglomerate consisting of businesses in the fields of engineering, construction, chemicals and petrochemicals. It has proposed the construction and operation of a world-scale ethane cracker and three polyethylene manufacturing plants in Parkersburg, WV, along with water treatment and energy co-generation facilities.[28] Odebrecht estimates the plant to cost $3.8 billion. Typically, ethane project investments of this magnitude employ more than 2,000 construction workers at their peak and 200-300 full-time employees during operation. The facility would be supplied by ethane and natural gas from the Marcellus and Utica shales.

This proposal is an example of how West Virginia could move further down the value chain from a fuels producer to a producer of value added petrochemical products. As Kevin DiGregorio, Executive Director of West Virginia-based Chemical Alliance Zone, stated, "[a] cracker in West Virginia just makes sense. The chemical industry historically follows abundant raw materials, and the vast amount of ethane in the Marcellus Shale provides a great foundation for new chemical manufacturing investments."[29]

Odebrecht has stated that a final investment decision will be made by the end of 2015.

2. Aither

Aither Chemical is evaluating locations in OH, PA, and WV to build a plant that would produce ethylene and related products.[30] Aither estimates the plant would cost $200 to $750 million and create 200 permanent jobs and 2,000 temporary construction jobs, with indirect job creation from the project resulting in as many as 1,400 more permanent jobs. [31] The plant would produce up to 600 million pounds of ethylene, 300 million pounds of acetic acid, 80 million pounds of carbon dioxide, and 40 million pounds of carbon monoxide each year, generating $450 million in annual revenues. The plant would use natural gas and ethane from the Marcellus Shale.

The Aither plant is another example of the manufacturing potential in the Marcellus and Utica areas. The economic benefits of these facilities are highly multiplicative, with 7– 10 times the indirect jobs (jobs related to supplier to these facilities) being created. The supply chain economic benefits are recognized by state governments. For example, West Virginia Governor Earl Ray Tomblin signed into

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[28] "Odebrecht Moves Forward with WV Cracker Plant Plans." Marcellus Drilling News. Sep. 2, 2014. http://marcellusdrilling.com/2014/09/odebrecht-moves-forward-with-wv-cracker-plant-plans
[29] "Industry Leaders Speak on Cracker." The Weirton Daily Times. Dec. 2, 2013. http://www.weirtondailytimes.com/page/content.detail/id/607182/Industry-leaders-speak-on-cracker.html?nav=5006
[30] "Aither Chemicals Mulls Plans for Cracker and PE plant in Marcellus Shale region." Plastics News. April 18, 2013. http://www.plasticsnews.com/article/20130418/NEWS/130419906/aither-chemicals-mulls-plans-for-cracker-and-pe-plant-in-marcellus-shale-region
[31] http://www.plasticsnews.com/article/20130418/NEWS/130419906/aither-chemicals-mulls-plans-for-cracker-and-pe-plant-in-marcellus-shale-region

law in 2012 a tax incentive plan designed to lure an ethane cracker plant to West Virginia. The law gives a 25-year property tax break to companies that spend more than $2 billion on such a facility.

3. Other Opportunities in the Region

Other similar investments reflect the potential for West Virginia counties to attract these types of manufacturing opportunities.

Shell has proposed the construction of an ethane cracker in Monaca, PA, in Beaver County, 35 miles northwest of Pittsburgh. The facility would be capable of producing 1.5 million tons of ethylene and 1.6 million tons of polyethylene annually and employ 400 people. Supporting the plant's operations would be three on-site natural gas-fired turbines, four emergency diesel generators, two cooling towers, and a water treatment facility.[32]

A partnership of PTT Global Chemical and Marubeni Corp is evaluating the construction of an ethane cracker on a 400-acre site at Mon River Industrial Park in Allenport, PA, as well as two undisclosed locations in Ohio and West Virginia, to take advantage of the natural gas supply from the Marcellus and Utica formations.[33]

Appalachian Resins plans to construct a $1 billion ethane cracker plant on a 50-acre site in Monroe County, OH, 130 miles east of Columbus. The project, which had initially been planned for West Virginia, is expected to bring 150 to 200 full-time jobs once the plant is running. The plant would be about one-third the size of the Shell and Odebrecht plants and could open in late 2018 or early 2019.[34]

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[32] Natural Gas Intelligence. "Shell Chemical Details Plans for PA Cracker in First Permit Application." Aug 5, 2014. http://www.naturalgasintel.com/articles/99275-shell-chemical-details-plans-for-pa-cracker-in-first-permit-application
[33] "Thai-Japanese Duo Angling for Another Marcellus Ethane Cracker." PowerSource. Sep. 28, 2014. http://powersource.post-gazette.com/powersource/companies-powersource/2014/10/16/Brazil-group-visits-to-learn-more-about-shale/stories/201410150210
[34] "Cracker Plant in the Works for Monroe County." The Columbus Dispatch. Oct. 16, 2014. http://www.dispatch.com/content/stories/business/2014/08/29/cracker-plant-in-the-works-for-monroe-county.html

3. Summary

The proposed MVP pipeline would provide a number of direct-use benefits to the eleven counties in West Virginia through which the pipeline would run. First, the pipeline would benefit existing customers as it would help ensure future access to a reliable supply of natural gas. Natural gas is already abundant in many parts of West Virginia due to the state's long history of gas operations. Eight of the eleven counties along the proposed MVP route have natural gas access in the major towns and areas. The MVP project could provide additional access and reliability for the residential, commercial, and municipal customers in these counties.

Second, the shale gas revolution has helped lower natural gas prices, making natural gas an economically attractive alternative to existing fuel sources. Counties with limited access to natural gas could realize significant benefits from the MVP pipeline if they were to switch a sizeable portion of their residential, commercial, municipal, and manufacturing customers from the existing fuel source over to natural gas. In Monroe County and Summers County, which both have limited access to natural gas, the MVP project would provide a north to south corridor to complement the Columbia Gas pipeline that runs east to west. In Webster County, which does not currently have access to natural gas, the MVP pipeline would run through the western part of the county and within 1.2 miles of the town of Cowen, the second-largest town in the county.

Third, a major natural gas pipeline like the MVP could draw new businesses that require high volumes of natural gas, particularly energy-intensive and advanced technology manufacturers that pay high wages. An example is Harrison County, which has a thriving aerospace industry, an average annual wage of $72,000, and an unemployment rate of 5.2%. Mark West in Doddridge County serves as another example of manufacturing benefits. The company plans to triple the capacity of its gas processing facility in Doddridge County, which provides wages 2.5 times higher than the county's average. Further evidence of the potential for natural gas to attract major investments in manufacturing is illustrated from investments in ethane cracker plants that are being considered. These include several plants being considered by Odebrecht, Aither, Shell, PTT Global/Marubeni, and Appalachian Resins.

These types of investments can provide large economic benefits to communities from an employment, wage, and tax revenue perspective. Input-output modeling software such as IMPLAN can help to estimate the magnitude of these impacts. In addition to the initial economic impact of the investment, businesses along the supply chain benefit through ripple, or multiplier, effects, as do households in the form of higher wages and disposable income.

Appendix: County Economic and Energy Profiles

1. Braxton

Economic Profile

Braxton County is a 517 square-mile county located in the center of West Virginia. It has a population of approximately 14,500 and has a household count of approximately 5,800. The county has had an underperforming economy. Its nominal GDP in 2014 was $371 billion or $25,600 per person.[35] The real GDP declined by 1.2% from 2013 to 2014[36] compared to the U.S. GDP real growth of 2.4%[37] during the same time period. Additionally, the county unemployment rate has been high – 8.8% in 2014 compared to 6.5% in West Virginia and 6.2% nationally.[38]

Sutton is the largest town with a population of 1,030 and is also the county seat. Gassaway is the second largest town in the county with a population of more than 900. Together these towns represent approximately 13% of the county's population. The vast majority of the population lives in rural parts of the county that does not have access to natural gas.

The county counted 343 employers in 2013 with total employment of 3,814 or 11.1 employees per employer.[39] Approximately 9% of the County residents work in manufacturing as shown in Table 7.

Table 7 – Employment in Braxton County by Sector[40]

Sector	Employment	Percent of Total Employment
Commercial	2,293	60%
Government	938	25%
Manufacturing	330	9%
Construction	206	5%
Resources and Mining	47	1%
Total	3,814	100%

[35] NACO County Tracker, 2013.
[36] Ibid.
[37] http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm; file "gdp2q15_2nd.xls" Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.
[38] Bureau of Labor Statistics
[39] Workforce WV. http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html
[40] Ibid.

While the commercial sector represents a large portion of the Braxton County economy, manufacturing is also an important sector. Manufacturing employs 330 workers, representing 9% of the jobs in the county. Below are some of the largest manufacturers:

- **Weyerhaeuser**: A public company, located in Heaters, that produces oriented strand board for the construction industry. The facility can produce approximately 500 million square feet of OSB per year, and it employs 140 people.
- **Appalachian Timber Services:** A privately-owned company that produces cross ties, switch ties, bridge ties, timber crossings, and custom wood products for the rail industry. It employs approximately 80 people.
- **Braxton Lumber:** A privately-owned lumber mill in Heaters. It employs approximately 20 people with annual revenue of $100K.

All three companies are closely situated nearby the I-79 corridor. These facilities mainly use electricity to drive their operations. For Weyerhaeuser, natural gas is used for process heating.

In Braxton County, the economic impact of manufacturing jobs is clear. As Table 8 shows, manufacturing wages are the second highest across all job sectors in the county ($57,944 per year) and are 35% higher than the average wage in the County.

Table 8 – Annual Average Wages in Braxton County by Sector[41]

Sector	Average Annual Wage
Resources and Mining	$83,048
Manufacturing	$57,944
Government	$54,172
Construction	$52,844
Commercial	$34,899
Weighted Average	**$43,036**

Energy Profile

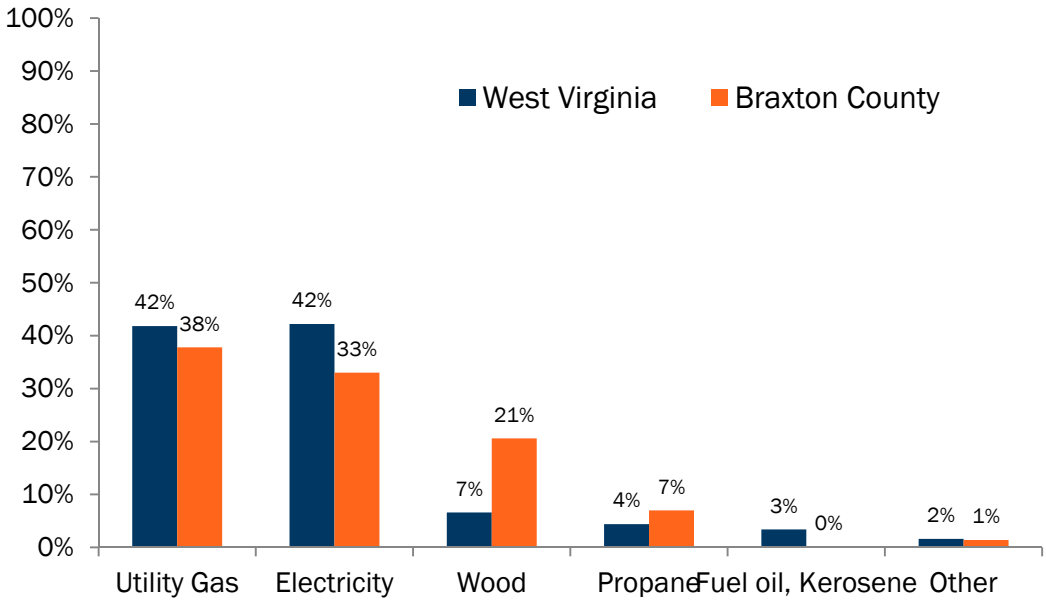
There is a surprising amount of gas accessibility in Braxton County given its low population density. The gas source for Sutton and Gassaway is from West Virginia gas productions wells (native supply).

Natural gas and electricity are the main residential home heating sources for the county as shown in Figure 20. A large portion of households in the county's towns use natural gas as their primary fuel

[41] Workforce WV. http://www.workforcewv.org/lmi/EandWAnnual/ew13cnty025.html.

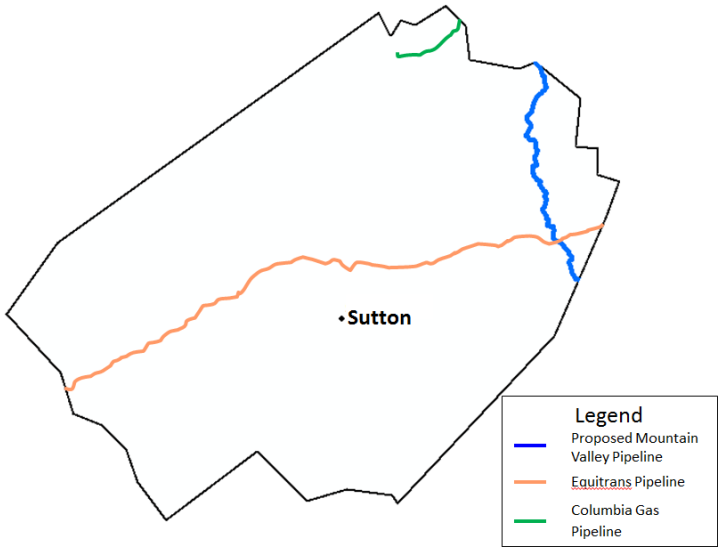
source for home and water heating. Typically, commercial and municipal buildings follow the same pattern since natural gas use often is driven by accessibility. Dominion Hope serves these towns.

Figure 20 - Primary Space Heating Fuel Used in Braxton County versus the State, Percentage of Housing Units[42]



The residential, commercial, and municipal sectors could benefit significantly from the proposed MVP pipeline as it would intersect on the east side of the county with the Columbia Gas Transmission Corporation's pipelines as shown in Figure 21. The MVP pipeline, if connected to this pipeline, could provide gas supply to Braxton County consumers as native production declines.

Figure 21 – Braxton County Natural Gas Pipeline Map



[42] 2013 US Census Bureau 5 Year American Community Survey

2. Doddridge

Economic Profile

Doddridge County is a 320 square-mile county located in the northwest part of West Virginia with a population of approximately 8,300 and has a household count of approximately 3,000. The county has a growing economy. Its nominal GDP in 2014 was $174 million or $20,877 per person.[43] The real GDP grew by 3.3% from 2013 to 2014, after growing nearly 20% the previous year,[44] compared to the U.S. GDP real growth of 2.4%[45] during the same time period. Additionally, the county unemployment rate was 5.9% in 2014, compared to 6.5% in West Virginia and 6.2% nationally.

West Union is the county seat and is the largest town with a population of 825. The Route 23 corridor in the northern part of the county is considered the population center of the county.

Doddridge County has experienced economic development challenges because of a lack of infrastructure. There is no interstate and mainline water access is restricted to an approximately eight-mile stretch along Route 23. There is also limited 3-phase electricity, which is required for large manufacturing and commercial facilities, and limited broadband.

In 2013, the county counted 110 employers with total employment of 1,246 or 11.3 employees per employer.[46] A majority of the county employment is in the commercial and government sectors (79%) as shown in Table 9.

Table 9 – Employment in Doddridge County by Sector[47]

Sector	Employment	Percent of Total Employment
Commercial	455	36%
Government	530	43%
Resources and Mining	144	12%
Construction	119	10%
Manufacturing	0	0%
Total	**1,248**	**100%**

[43] National Association of Counties. http://www.uscounties.org/countyTracker/index.html
[44] National Association of Counties. http://www.uscounties.org/countyTracker/index.html
[45] http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm; file "gdp2q15_2nd.xls" Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.
[46] WorkForce WV: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html
[47] WorkForce WV: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html

Resource and mining represents 12 % of the county employment and is composed entirely of oil and gas production. This sub-sector has grown in recent years.[48] As evidence, Mark West in 2013 opened a new gas processing facility outside West Union that employs approximately 25 people. The company plans to triple its capacity in the near future. During the construction of the facility, Mark West employed about 200 local electricians, pipefitters, welders, carpenters and other tradespeople.[49]

As Table 10 shows, the resources and mining industry, which includes the Mark West facility, has significantly higher wages, on average, than the other major sectors.

Table 10 – Annual Average Wages in Doddridge County by Sector[50]

Sector	Average Annual Wage
Resources and Mining	$104,946
Construction	$40,780
Government	$32,216
Commercial	$25,549
Manufacturing	N/A
Weighted Average	**$39,016**

Natural gas is important to the county's economic growth. FTI found that oil and gas development represents the near-term economic growth driver for the county. The MVP pipeline offers an opportunity for developers to move their natural gas via the pipeline to ten other counties in West Virginia, six counties in Virginia, and a large portion of the U.S. Southeast, which could translate into significant impacts to the county's economy. In Lewis County, for example, the oil and gas sector comprises approximately 20% of the workforce and the average wages for the sector lead all other sectors. Coincidentally, Lewis County has the third lowest county unemployment rate in the State.

While having good timber resources, the timber industry currently is not very active due to economics. This is partially due to infrastructure constraints as timber companies are challenged to get timber out of the county via the existing road infrastructure.

There are no major manufacturers in Doddridge County; however, Simonton Windows in neighboring Ritchie County is a large employer of county residents.

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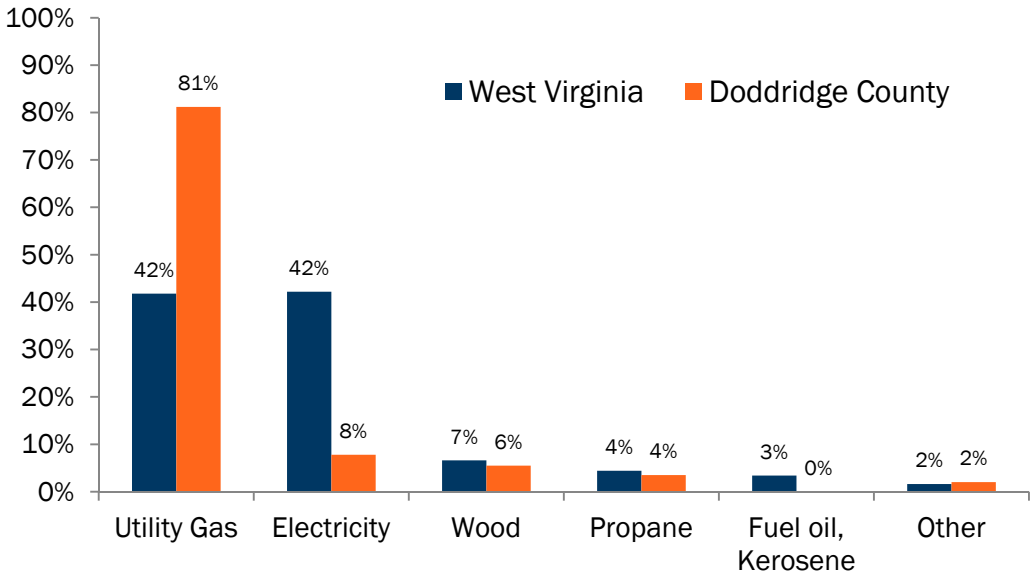
[48] http://www.drillingedge.com/west-virginia/doddridge-county
[49] http://www.wvillustrated.com/story/20280391/new-markwest-natural-gas-processing-online-in-doddridge-co
[50] WorkForce WV: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html

Energy Profile

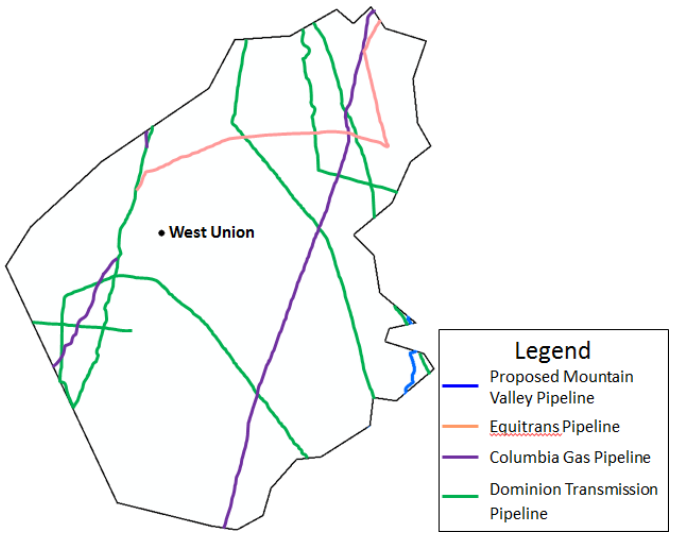
Due to native natural gas production, gas is the primary residential home heating source for the county as shown in Figure 22. Typically commercial and municipal buildings follow the same pattern since natural gas as a fuel choice often is driven by accessibility. Peoples Gas serves West Union.

Figure 22 – Primary Space Heating Fuel Used in Doddridge County versus the State, Percentage of Housing Units[51]



All sectors could benefit significantly from the MVP pipeline as it would intersect the Dominion pipeline on the east side of the county (Figure 23). If connected with this pipeline, MVP could provide gas supply as native production declines.

Figure 23 – Doddridge County Natural Gas Pipeline Map



[51] 2013 US Census Bureau 5 Year American Community Survey

3. Greenbrier

Economic Profile

Greenbrier County in West Virginia covers 1,025 square miles and is home to 35,644 residents. The county has a relatively strong economy. Its nominal GDP in 2014 was $1.3 billion or $36,472 per person.[52] The real GDP declined by 1.5% from 2013 to 2014[53] compared to the U.S. GDP real growth of 2.4%[54] during the same period. Additionally, the county unemployment rate was 7.0% in 2014, compared to 6.5% in West Virginia and 6.2% nationally.

Lewisburg is the county seat and with 3,330 residents is the most populous city. Other cities include Ronceverte (pop. 1,765; five miles from Lewisburg), White Sulphur Springs (pop. 2,444; 10 miles from Lewisburg), and Fairlea (pop. 1,747; 2 miles from Lewisburg). The community of Maxwelton is home to the Rahall Technology and Business Center, a 137,000 square foot facility adjacent to the Greenbrier Valley Airport, and which the Greenbrier Chamber of Commerce describes as the eastern anchor of the I-64 technology corridor between Lewisburg, White Sulphur Springs, and Beckley. The Greenbrier Valley Economic Development Corporation (GVEDC) owns the facility in addition to the Fountain Springs business park in Monroe County and the Edray business park in Pocahontas County.

The county counted 1,108 employers in 2013 with total employment of 13,524 or 12.2 employees per employer.[55] Approximately 6% of the County residents work in manufacturing (see Table 11).

Table 11– Employment in Greenbrier County by Sector[56]

Sector	Employment	Percent of Total Employment
Commercial	9,566	71%
Government	2,478	18%
Manufacturing	768	6%
Construction	368	3%
Resources and Mining	344	3%
Total	**13,524**	**100%**

[52] National Association of Counties. http://www.uscounties.org/countyTracker/index.html
[53] National Association of Counties. http://www.uscounties.org/countyTracker/index.html
[54] http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm; file "gdp2q15_2nd.xls" Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.
[55] Workforce WV. http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html
[56] Ibid.

In Greenbrier County, manufacturing employs over 700 workers, representing 6% of the jobs in the county. Below are some of the largest manufacturers in the county:

- **ABB:** ABB is a large supplier of industrial motors and drives, generators for the wind industry, and power grids, with 145,000 employees worldwide. Its Lewisburg manufacturing center produces process automation instrumentation. The plant is 95,000 square feet and employs 160 people.

- **Mullican Flooring:** Mullican is a manufacturer of hardwood flooring products in Ronceverte, WV, with approximately 120 employees.

In Greenbrier County, the manufacturing sector provides a significant economic impact as shown in Table 12. Manufacturing wages are the second highest across all job sectors in the county ($40,323 per year) and are 23% higher than the average wage in the county.

Table 12 – Annual Average Wages in Greenbrier County by Sector[57]

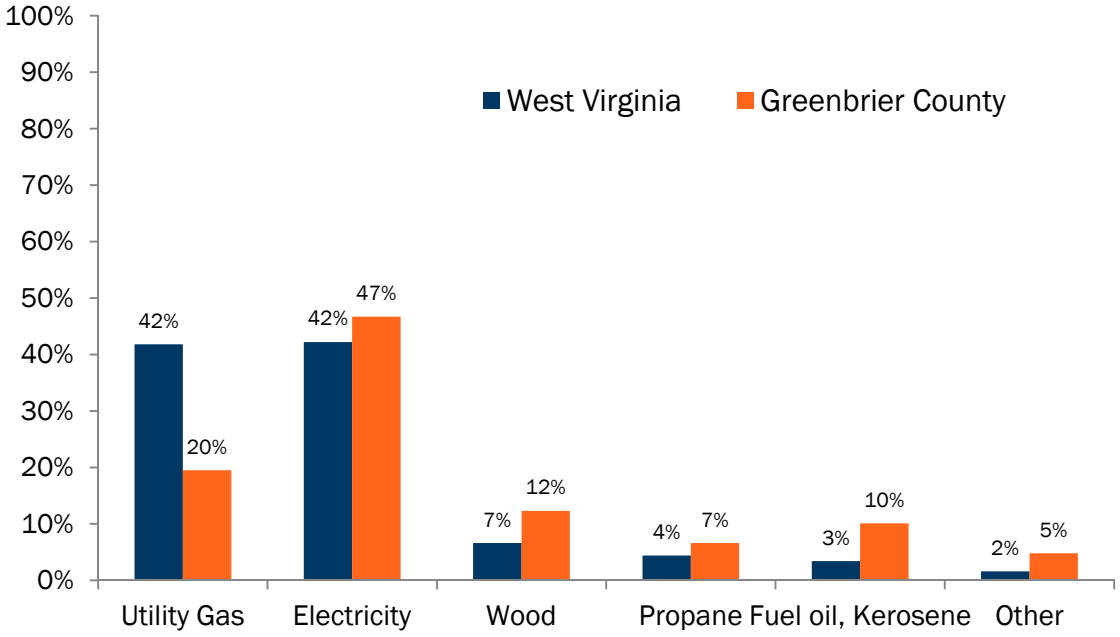
Sector	Average Annual Wage
Resources and Mining	$59,974
Manufacturing	$40,323
Government	$35,973
Commercial	$30,416
Construction	$29,282
Weighted Average	**$32,718**

Energy Profile

Residential, commercial, and municipal access to natural gas also is available in the larger towns. Homes in rural areas rely on wood, propane and fuel oil for heat. Overall residential natural gas usage in Greenbrier County is significantly lower than the rest of the state (See Figure 24).

[57] WorkForce WV. http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html

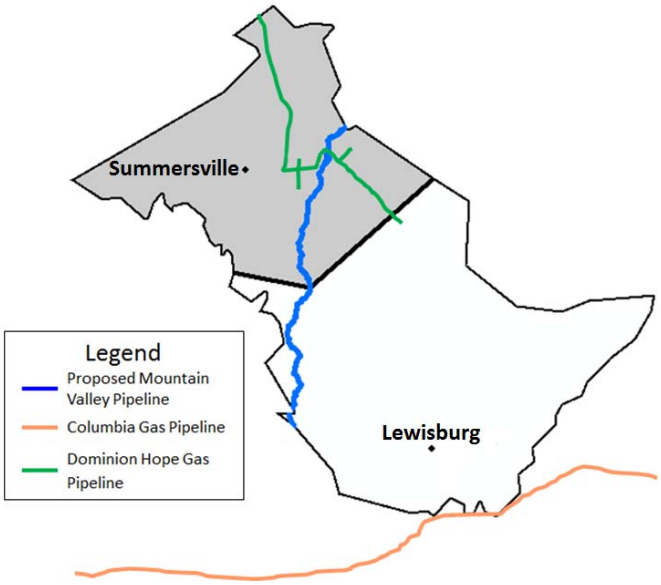
Figure 24 - Primary Space Heating Fuel Used in Greenbrier County versus the State, Percentage of Housing Units[58]



The Mountain Valley pipeline is currently planned to traverse the western section of the county. Most the towns and businesses are in the Lewisburg area and toward the eastern border. The pipeline could bring natural gas supply to the western portion of the county, which could enable economic growth. See Figure 25 below.

[58] 2013 US Census Bureau 5 Year American Community Survey.

Figure 25 – Greenbrier County Natural Gas Pipeline Map



Outside of Lewisburg, The Greenbrier resort in White Sulphur Springs is one of the largest commercial consumers of electricity and natural gas in the county and the state. The complex includes 710 bedrooms, 9 restaurants and a casino. Due to its size, the resort buys its natural gas from wholesale marketing company. It then pays a transport charge to deliver the gas. Additional gas supply in Greenbrier County would be welcomed by the resort.

For the manufacturing sector in Greenbrier County, the primary fuel sources are electricity and natural gas. Natural gas is used mainly for heating. The manufacturing facilities are located where natural gas sources are available, so there is no fuel switching potential.

4. Harrison

Economic Profile

Harrison County is a 417 square-mile county located in north-central West Virginia with a population of approximately 69,000 and has a household count of approximately 27,900. The county has a strong economy. Its nominal GDP in 2013 was $4.2 billion or $60,900 per person.[59] The real GDP declined by 0.3% from 2013 to 2014[60] compared to the U.S. GDP real growth of 2.4%[61] during the same time period. Additionally, the county unemployment rate was 5.2% in 2014, compared to 6.5% in West Virginia and 6.2% nationally.

Clarksburg is the largest town with a population of 16,360 and is also the county seat, followed by Bridgeport (pop. 8,149) and then Shinnston (pop. 2,186). Together these three towns and cities represent approximately 40% of the county's population.

The county counted 2,091 employers in 2013 with total employment of 34,881 or 16.7 employees per employer.[62] A majority of the county employment is in the commercial and government sectors (86%). Approximately 6% of the County residents work in manufacturing as shown in Table 13.

Table 13 – Employment in Harrison County by Sector[63]

Sector	Employment	Percent of Total Employment
Commercial	22,048	63%
Government	7,965	23%
Manufacturing	2,097	6%
Construction	1,702	5%
Resources and Mining	1,069	3%
Total	**34,881**	**100%**

In Harrison County, the economic impact of manufacturing jobs is clear. As Table 14 shows, manufacturing wages are the second highest across all job sectors in the county ($57,944 per year) and are 35% higher than the average wage in the County.

[59] "County Tracker 2013 – Harrison County, WV," National Association of Counties, January 2014.
[60] Ibid.
[61] http://www. bea. gov/newsreleases/national/gdp/gdpnewsrelease. htm; file "gdp2q15_2nd. xls" Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.
[62] WorkForce WP: http://www. workforcewv. org/lmi/Earnings_N_Wages/EnW. html; FTI analysis.
[63] Ibid.

Table 14– Annual Average Wages in Harrison County by Sector[64]

Sector	Average Annual Wage
Resources and Mining	$83,048
Manufacturing	$57,944
Government	$54,172
Construction	$52,844
Commercial	$34,899
Weighted Average	**$43,036**

In Harrison County, manufacturing employs over 2,000 workers, representing 6% of the jobs in the county. The primary fuel sources for Harrison County manufacturers are electricity and natural gas. Below are some of the largest manufacturers in the county:

- **Aurora Flight Services:** the company develops and manufactures advanced unmanned systems and aerospace vehicles. In Bridgeport, the shop fabricates and assembles composites and metal aerostructures.
- **Bombardier Services Corporation:** The privately-held company does business in Bridgeport, WV, as the West Virginia Air Center, a modern, 125,000 square foot facility where it employs 400 people to perform airline maintenance, repair, and overhaul services.
- **EuropTec:** a manufacturer of acid etched anti-glare glass, EagleEtch®, and a specialist in glass processing and fabrication for the display industry. It employs approximately 60 people.
- **Graftech:** The privately-held company has a facility in Anmoore, WV, where it produces specialty carbon and graphite products through a baking process in natural gas-fired, high temperature ovens and electrically heated furnaces from raw materials consisting of petroleum coke and coal tar pitch.
- **Pratt & Whitney Engine Services (PWES):** The company provides aerospace and manufacturing jobs to 400 employees at its overhaul and repair facility in Bridgeport, WV. In 1988 and 1999, PWES expanded its operations by adding 123,000 square feet, bringing the overall size to 200,000 square feet. Additionally, in 1997, the Joint Primary Aircraft Training System (JPATS) Program began in Bridgeport. New JPATS engines are assembled and tested and the overhaul and repair of the engines are completed at the Bridgeport facility. These engines directly support the aircraft that are used to train new U.S. Air Force and Navy pilots.

[64] WorkForce WP: http://www. workforcewv. org/lmi/Earnings_N_Wages/EnW. html; FTI analysis.

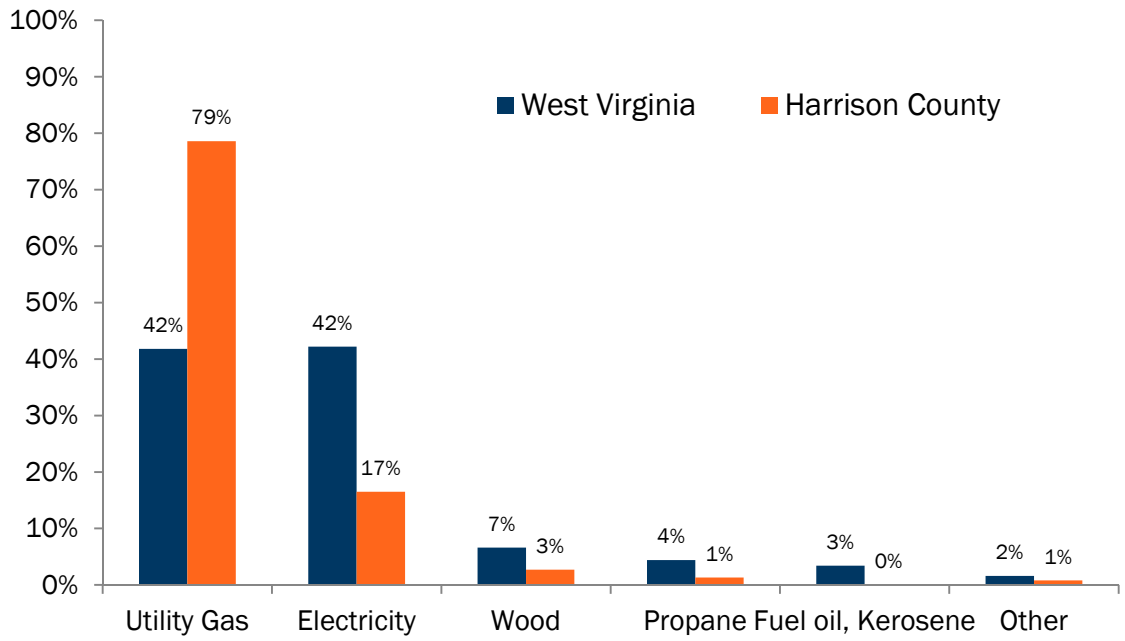
- **Stockmeier Urethanes**: a German company that produces polyurethane products such as sport surfaces, weather-resistant elastomers for roofs, parking decks and trucks, structural adhesives, casting resins for cable, electrical and technical applications, and ancillary products such as cleaners and catalysts. The Clarksburg facility is a blending facility that employs approximately 15 people.

PWES, Bombardier, and Aurora are situated at the Mid-Atlantic Aerospace Complex located at the North Central West Virginia Airport, which is adjacent to I-279. The average annual salary for the 650 employees in the aerospace industry in Harrison County is $72,000. This park has natural gas access provided by Dominion Hope.

Energy Profile

Natural gas is the main residential home heating sources for the county (see Figure 26). We understand that a large portion of households in populated areas use natural gas as their primary fuel source for home and water heating. Typically, commercial and municipal buildings follow the same pattern since natural gas as a fuel choice often is driven by accessibility. We confirmed that twenty-four schools in the Harrison County system are served by natural gas from Dominion Hope.

Figure 26 – Primary Space Heating Fuel Used in Harrison County versus the State, Percentage of Housing Units[65]

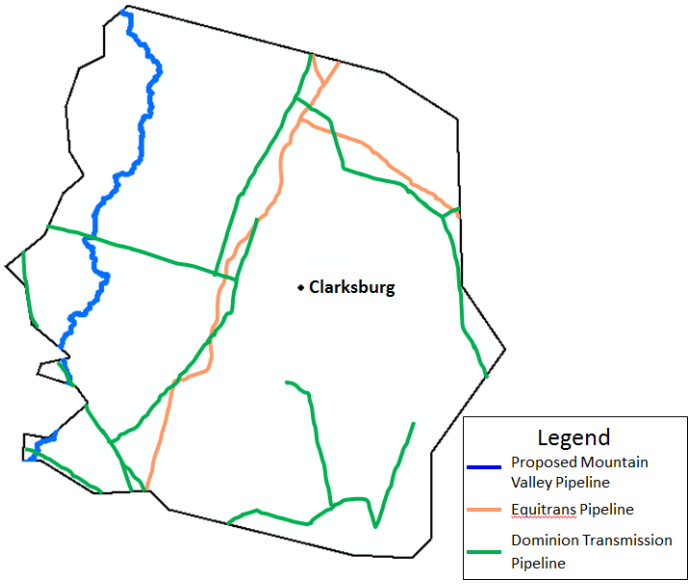


The residential, commercial, and municipal sectors could benefit significantly from the MVP pipeline as it would intersect the Dominion pipelines on the west side of the county as shown in Figure 27.

[65] 2013 US Census Bureau 5 Year American Community Survey

The MVP pipeline, if connected with this pipeline, could provide gas supply to Harrison County consumers as native production declines.

Figure 27 – Harrison County Natural Gas Pipeline Map



5. Lewis

Economic Profile

Lewis County is a 390 square-mile county located in located in north-central West Virginia at the crossroads of Interstate 79 and U.S. 33. It has a population of approximately 16,500 with a household count of approximately 6,900. The county has a strong economy. Its nominal GDP in 2014 was $1.2 billion or $72,939 per person.[66] The real GDP grew by 4.6% from 2013 to 2014[67] compared to the U.S. GDP real growth of 2.4%[68] during the same time period. Additionally, the county unemployment rate was 5.4% in 2014, compared to 6.5% in West Virginia and 6.2% nationally.

Weston is the county seat with a population of 4,110. There is also the small town of Jane Lew with a population of around 400. Together these areas represent approximately 27% of the county's population.

The county counted 482 employers in 2013 with total employment of 7,120 or 14.8 employees per employer.[69] A large portion of the county employment is in the commercial and government sectors (71%). Within Medical care for central West Virginians is today one of the county's chief sources of employment and income.[70]

Resources and mining, the second largest sector, is focused completely on gas development, which has been a growth sector for the county. Approximately 3% of the County residents work in manufacturing as shown in Table 15.

Table 15 – Employment in Lewis County by Sector[71]

Sector	Employment	Percent of Total Employment
Commercial	3,647	51%
Resources and Mining	1,530	21%
Government	1,450	20%
Construction	270	4%
Manufacturing	223	3%
Total	**7,120**	**100%**

[66] National Association of Counties. http://www.uscounties.org/countyTracker/index.html
[67] National Association of Counties. http://www.uscounties.org/countyTracker/index.html
[68] http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm; file "gdp2q15_2nd.xls" Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.
[69] WorkForce WV: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html
[70] http://www.wvencyclopedia.org/articles/1362
[71] WorkForce WP: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html

Viking Pools, which manufactures hot tubs, spas and whirlpool baths, represents the primary manufacturing employer in Lewis County. Tamarack Log Homes (which is classified as construction, but could be considered quasi-manufacturing) is another large employer. Both are located at the industrial park near the Jane Lew exit of I-79.

The annual average wages for the construction and manufacturing sectors in Lewis County range from $41,200 to $45,100 as shown in Table 16, which is around the average for the county and is well below the annual average salary of $72,000 at the more high-end manufacturing facilities of Bombardier and Pratt & Whitney in Harrison County.

Table 16– Annual Average Wages in Lewis County by Sector[72]

Sector	Average Annual Wage
Resources and Mining	$77,305
Construction	$45,087
Manufacturing	$41,174
Government	$35,641
Commercial	$33,896
Weighted Average	**$44,231**

The primary growth sector for Lewis County in recent years has been the oil and gas sub-sector under Resources and Mining. The county has become an operational hub for many companies involved in Marcellus Shale development. Companies such as Nexus Drilling, Chesapeake Energy, and Superior Well Services have expanded operations significantly, employing approximately 1,500 people or 20% of the workforce in the county. The average wage for oil and gas extraction employees in Lewis County has been ~$77,300. It is worth noting that Lewis County now has the third lowest unemployment in the state after Monongalia and Jefferson counties.

This boon has been helpful in offsetting manufacturing decline. In 2013 Halliburton shut down their cement plant operations in Weston, WV, and moved it 150 miles away to Zanesville, OH. The company had employed approximately 75 people.

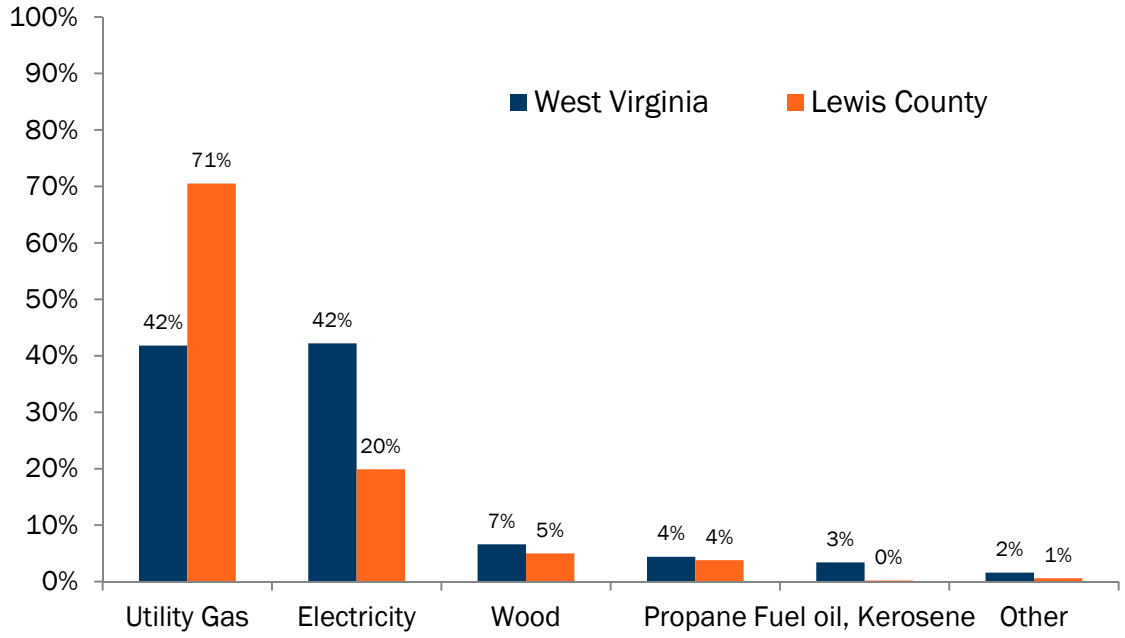
Energy Profile

Large quantities of oil and natural gas were found around 1900 in Lewis County, which created a manufacturing boom. The gas attracted several glass manufacturers to the county. Gas production is still a major part of the county's profile, and production continues in the Weston and Jane Lew areas.

[72] WorkForce WP: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html; FTI analysis.

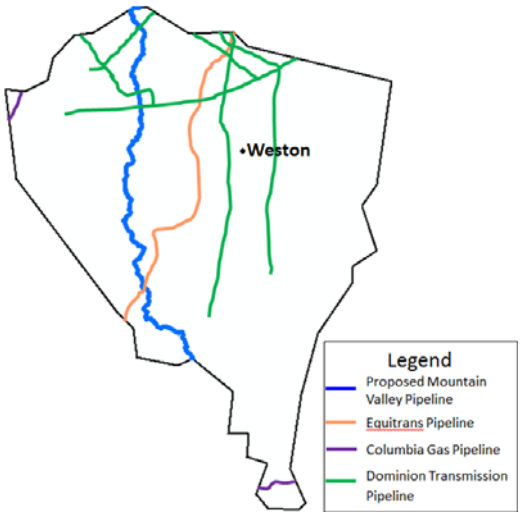
Due to native natural gas production, gas is the primary residential home heating source for the county as shown in Figure 28. Typically commercial and municipal buildings follow the same pattern since natural gas as a fuel choice often is driven by accessibility. Dominion Hope serves these towns.

Figure 28 – Primary Space Heating Fuel Used in Lewis County versus the State, Percentage of Housing Units[73]



All economic sectors could benefit significantly from the MVP pipeline as it would overlap with the Equitrans and Dominion Pipelines as shown in Figure 29. The MVP pipeline, if connected, could provide additional gas supply to Lewis County consumers as native production declines.

Figure 29 – Lewis County Natural Gas Pipeline Map



[73] 2013 US Census Bureau 5 Year American Community Survey

6. Monroe

Economic Profile

Monroe County is a 474 square-mile county located in West Virginia with a population of 13,483. Its nominal GDP in 2014 was $190 million or $14,107 per person.[74] The county has had a relatively underperforming economy. The real GDP declined by 1.2% from 2013 to 2014[75] compared to the U.S. GDP real growth of 2.4%[76] during the same time period; however, the country unemployment rate was 5.6% in 2014, compared to 6.5% in West Virginia and 6.2% nationally.

Union is the county seat and has a population of 565, Alderson, which is 40 miles from Union, is the largest town with a population of 1,184. Peterstown, 25 miles from Union, has a population of 653. Together these three towns represent 18% of the county's population.

Monroe County is primarily a farming county, with a mix of livestock (cattle, dairy, and sheep) and crop farming (hay, corn, oats, wheat, and tobacco). Timber is also a major contributor to the economy.[77]

The county counted 230 employers in 2013 with total employment of 1,888 or 8.2 employees per employer.[78] Monroe only has one major employer, UTC Aerospace, which represents approximately 21% of the jobs in the county (see Table 17).

Table 17 – Employment in Monroe County by Sector[79]

Sector	Employment	Percent of Total Employment
Government	718	38%
Commercial	617	33%
Manufacturing	400	21%
Construction	111	6%
Resources and Mining	42	2%
Total	**1,888**	**100%**

[74] National Association of Counties. http://www.uscounties.forg/countyTracker/index.html
[75] National Association of Counties. http://www.uscounties.org/countyTracker/index.html
[76] http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm; file "gdp2q15_2nd.xls" Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.
[77] http://www.wvencyclopedia.org/articles/2024
[78] Workforce WV. http://www.workforcewv.org/lmi/EandWAnnual/ew13cnty025.html.
[79] Workforce WV. http://www.workforcewv.org/lmi/EandWAnnual/ew13cnty025.html.

UTC, formerly Goodrich, is a global supplier of systems and services for the aerospace and defense industries and is located in Union. The facility is 140,000 square feet, and it is powered by a combination of electricity and natural gas. The other major employer in the county is M-Rock, which is a stone and brick designer and manufacturer in Peterstown, WV, and employs 25 people and has annual revenue of $1M.

The manufacturing sector provides the highest average annual wage in Monroe County (see Table 18).

Table 18 – Annual Average Wages in Monroe County by Sector[80,81]

Sector	Average Annual Wage
Manufacturing	$50,000
Government	$41,120
Construction	$29,283
Resources and Mining	$26,426
Commercial	$20,959
Weighted Average	**$34,573**

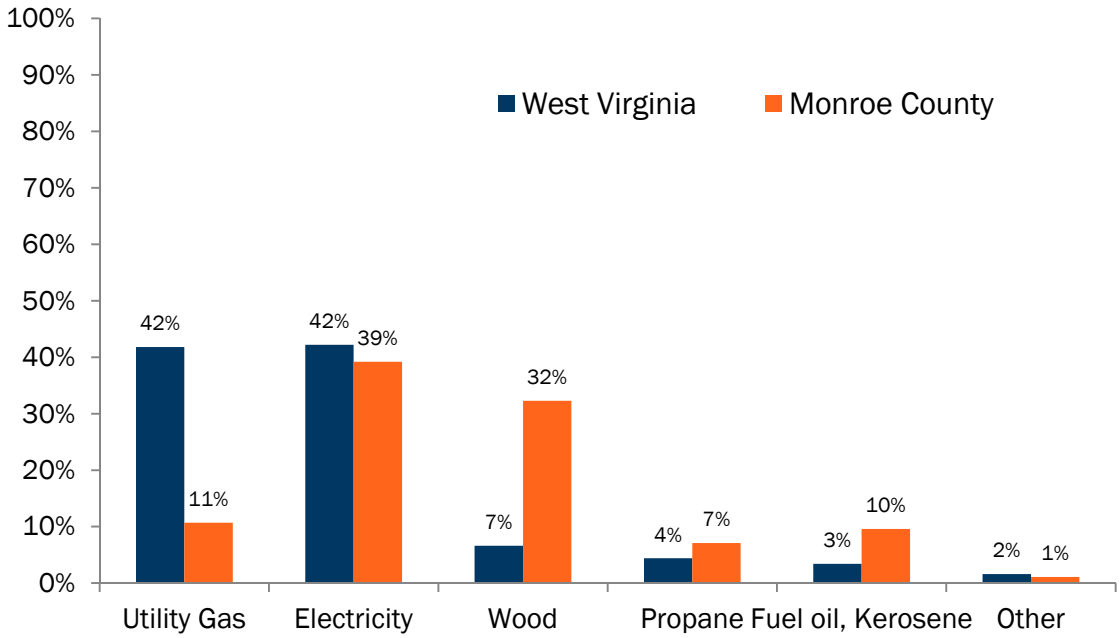
There are a number of county residents who work outside the county at The Greenbrier resort at White Sulphur Springs, the Celanese plant in Narrows, Virginia, and MeadWestvaco plant in Covington, Virginia.[82]

Energy Profile

Electricity and wood are the main residential home heating sources for the county (see Figure 30). Typically, commercial and municipal buildings follow the same pattern since fuel choice often is driven by accessibility so there is ample opportunity for switching to natural gas with potential access in the county. Monroe only has natural gas service in the small towns of Union and Petersburg.

[80] Workforce WV. http://www.workforcewv.org/lmi/EandWAnnual/ew13cnty025.html.
[81] We assumed $50,000 for the UTC manufacturing facility in Monroe that employs approximately 400 people because data for UTC was not available. This is a conservative assumption, relative to the $72,000 average wage for aerospace jobs in Harrison County.
[82] http://www.wvencyclopedia.org/articles/2024

Figure 30 – Primary Space Heating Fuel Used in Monroe County versus the State, Percentage of Housing Units[83]



While there is a Columbia Gas pipeline that runs east-west through the county, most of the communities in the county do not have gas access or have very limited gas access.[84] It is possible that the residential, commercial, and municipal sectors could benefit significantly from the MVP pipeline as it would intersect with the Columbia Gas Pipeline on the west side of the county as shown in Figure 31.

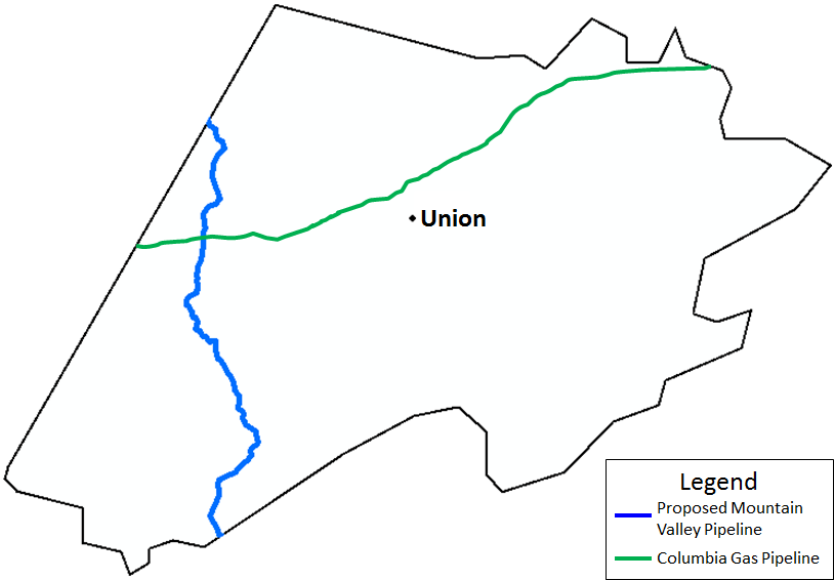
The MVP pipeline could provide access to existing manufacturers if connected to the existing Columbia Gas pipeline.

Two of the schools in the county are heated using natural gas. The other two schools, both located in Peterstown, are heated using electricity. They are within the service area for natural gas, but they are older buildings that have always used electricity.

[83] 2013 US Census Bureau 5 Year American Community Survey

[84] Interviews with Monroe county officials indicated that part of Peterson is served by Mountaineer and that other towns likely do not have gas access.

Figure 31 – Monroe County Pipelines – Existing and Proposed



7. Nicholas

Economic Profile

Nicholas County is a 654 square-mile county located in the center of West Virginia. It has a population of approximately 26,000. The county has had an underperforming economy. Its nominal GDP in 2014 was $937 million or $36,072 per person.[85] The real GDP grew by 1.4% from 2013 to 2014[86] compared to the U.S. GDP real growth of 2.4%[87] during the same time period. Additionally, the country unemployment rate has been high – 9.0% in 2014 compared to 6.5% in West Virginia and 6.2% nationally. [88]

Summersville is the largest town with a population of 3,572 and is also the country seat. Richwood, 25 miles to the east, has a population of 2,051. Together these two towns represent approximately 20% of the county's population.

The county counted 711 employers in 2013 with total employment of 7,983 or 11.2 employees per employer.[89] A large portion of the county employment is in the commercial and government sectors (79%) as shown in Table 19.

Table 19 – Employment in Nicholas County by Sector[90]

Sector	Employment	Percent of Total Employment
Commercial	4,539	57%
Government	1,746	22%
Manufacturing	741	9%
Resources and Mining	700	9%
Construction	257	3%
Total	**7,983**	**100%**

Approximately 9% of the County residents work in manufacturing. Below are the largest manufacturers in the county:

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[85] National Association of Counties. http://www.uscounties.org/countyTracker/index.html
[86] National Association of Counties. http://www.uscounties.org/countyTracker/index.html
[87] http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm; file "gdp2q15_2nd.xls" Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.
[88] Bureau of Labor Statistics
[89] Workforce WV. http://www.workforcewv.org/lmi/EandWAnnual/ew13cnty025.html.
[90] Workforce WV. http://www.workforcewv.org/lmi/EandWAnnual/ew13cnty025.html.

- **B/E Aerospace:** the company is a manufacturer of aircraft cabin interior products and a leading provider of aerospace fasteners, consumables, and logistics services. This is a global company with its De-Icing Systems location in Fenwick, WV. The facility employs approximately 160 people.

- **Columbia Forest Products:** the company is North America's largest manufacturer of hardwood plywood and hardwood veneer products, with a manufacturing location in Craigsville, WV. The facility employs approximately 380 people.

Together, Columbia Wood Products and B/E Aerospace the companies employ approximately 70% of those employed in the county's manufacturing sector.

Manufacturing has had a significant economic impact In Nicholas County. As Table 20 shows, manufacturing wages are the second highest across all job sectors in the county ($46,434 per year) and are 30% higher than the average wage in the County.

Table 20 – Annual Average Wages in Nicholas County by Sector[91]

Sector	Average Annual Wage
Resources and Mining	$70,155
Manufacturing	$46,434
Government	$39,355
Construction	$34,554
Commercial	$27,133
Weighted Average	**$35,609**

Outside of the manufacturing sector, Nicholas County is known for economic resources including bituminous coal, limestone quarries, timber, fruit farms, tobacco, and livestock.[92]

Within the residential, commercial, and municipal sectors, we identified a few fuel switching opportunities. Two schools use coal boilers for space heating and water heating, and one school uses propane.

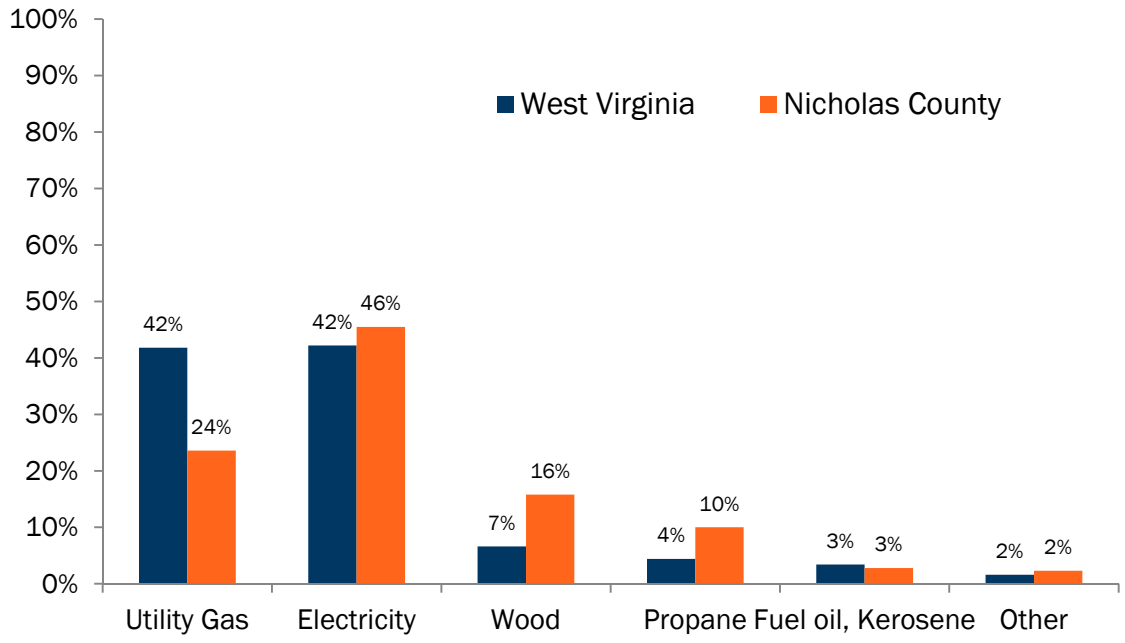
[91] Workforce WV. http://www.workforcewv.org/lmi/EandWAnnual/ew13cnty025.html.
[92] http://www.wvencyclopedia.org/articles/1670

Energy Profile

There is a surprising amount of gas accessibility in Nicholas County given its low population density. The gas source for Summersville and Richwood is from West Virginia gas productions wells (native supply).

Electricity is the main residential home heating source for the county as shown in Figure 32, and it is mainly used a heating source outside of Summersville and Richwood. It is worth noting that Nicholas County is home to the Summersville Hydroelectric Project – an 80 MW hydro plant that generates 220 gigawatt hours annually.

Figure 32 – Primary Space Heating Fuel Used in Nicholas County versus the State, Percentage of Housing Units[93]



Within Summersville and Richwood, a large portion of households use natural gas as their primary fuel source for home and water heating. Typically, commercial and municipal buildings follow the same pattern since natural gas as a fuel choice often is driven by accessibility. Dominion Hope is the utility serving these towns.

The residential, commercial, and municipal sectors could benefit significantly from the MVP pipeline as it would intersect with the Dominion Hope pipeline near the center of the county as shown in Figure 33. The MVP pipeline, if connected with these pipelines, could provide additional gas supply to Nicholas County consumers as native production declines.

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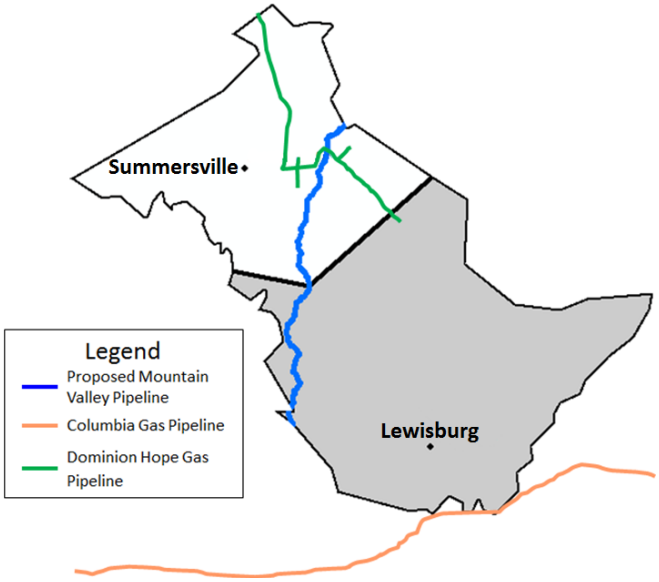
[93] 2013 US Census Bureau 5 Year American Community Survey.

Figure 33 – Nicholas County Natural Gas Pipeline Map



For the manufacturing sector, the primary fuel source is electricity with some natural gas used for process heat and steam.

8. Summers

Economic Profile

Summers County is a 368 square-mile county located in south-east West Virginia with a population of 13,563 and has a household count of approximately 5,500. Its nominal GDP in 2014 was $221 million or $16,316 per person.[94] The real GDP shrunk by 1.9% from 2013 to 2014[95] compared to the U.S. GDP real growth of 2.4%[96] during the same time period. Additionally, the county unemployment rate was 7.4% in 2014, compared to 6.5% in West Virginia and 6.2% nationally.

Hinton is the county seat and largest city with a population of 2,676 and represents 20% of the county population.

Summers has been challenged with economic growth, starting in the 1950s when a combination of factors led to the decline of the local economy. These factors included technology changes in coal mining, the depletion of older mines, no viable local manufacture of coking coal, and the replacement of the coal-fired locomotives with diesel-fired locomotives.

Other economic challenges in Summers County include terrain and infrastructure. Summers County is a mountainous county. The flat areas, where manufacturers would want to locate, typically are along the rivers and are considered flood plains. For infrastructure, there is no interstate highway that runs through the county, which has limited the county's development. There is, though, the main rail line for CSX that runs from Chicago to Washington, D.C. It runs through Hinton and then Alderson.

The county counted 193 employers in 2013 with total employment of 2,091 or 10.8 employees per employer.[97] A large portion of the county employment is in the commercial and government sectors (93%). Approximately 1% of the County residents work in manufacturing as shown in Table 21.

Table 21 – Employment in Summers County by Sector[98]

Sector	Employment	Percent of Total Employment
Commercial	1,174	56%
Government	779	37%
Construction	83	4%
Resources and Mining	32	2%
Manufacturing	23	1%
Total	**2,091**	**100%**

[94] National Association of Counties. http://www.uscounties.org/countyTracker/index.html
[95] National Association of Counties. http://www.uscounties.org/countyTracker/index.html
[96] http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm; file "gdp2q15_2nd.xls" Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.
[97] WorkForce WV: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html
[98] WorkForce WV: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html

Summers County has a small manufacturing sector. The annual average wages for the manufacturing sector is $21,593 as shown in Table 22, which is lower than the average for the county.

Table 22– Annual Average Wages in Summers County by Sector[99]

Sector	Average Annual Wage
Construction	$39,293
Commercial	$27,955
Government	$27,695
Manufacturing	$21,593
Resources and Mining	$18,176
Weighted Average	**$28,089**

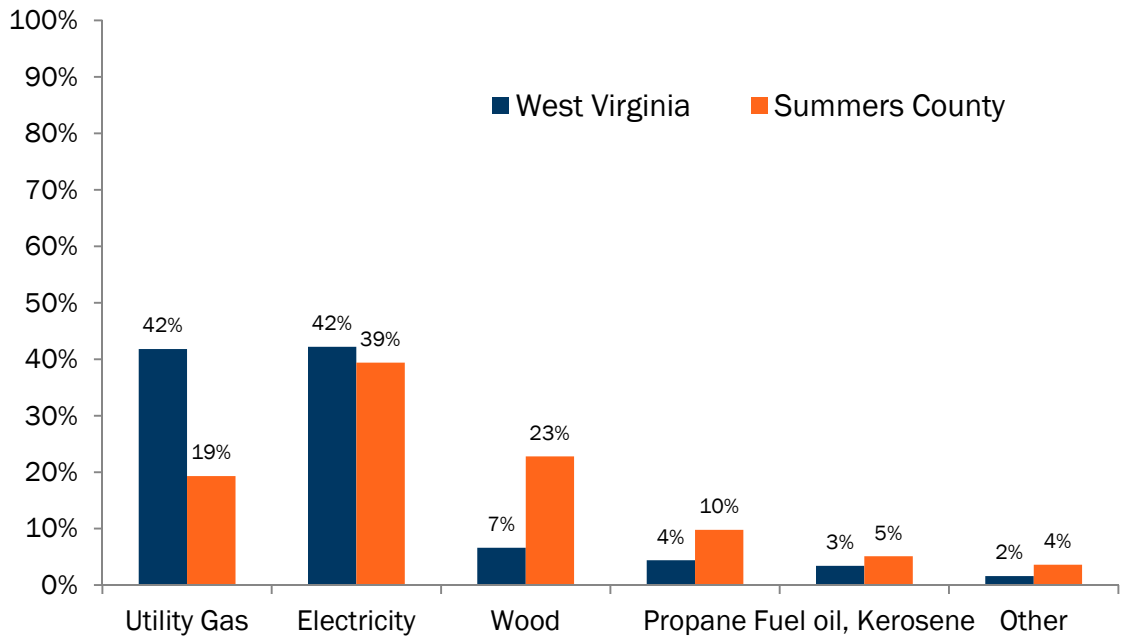
The planned route of the MVP pipeline in the northeastern portion of the county is near Alderson, which is just outside the county on the border of Monroe and Greenbrier counties. Alderson is 5.5 miles from the planned route, and the intersection of the pipeline path and existing rail infrastructure could enable some manufacturing development in the northeastern part of the county.

Energy Profile

Summers County has limited amounts of natural gas production and this production has been declining over the years.[100] Electricity is the primary residential home heating source for the county as shown in Figure 34. Mountaineer Gas serves the town of Hinton via the interstate Columbia Gas line, but other parts of the county do not have access to natural gas.

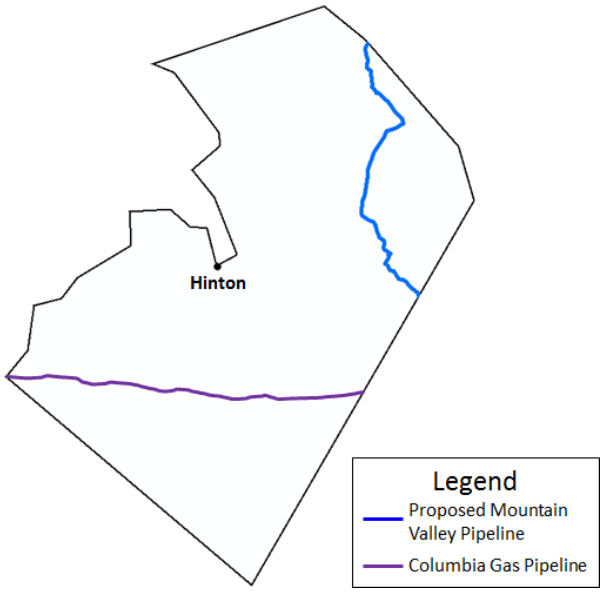
[99] WorkForce WP: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html; FTI analysis.
[100] http://www.drillingedge.com/west-virginia/summers-county

Figure 34 – Primary Space Heating Fuel Used in Summers County versus the State, Percentage of Housing Units[101]



All sectors could benefit from the MVP. The pipeline could give access to the developing portions of the northeastern part of the county near Alderson (Figure 35). Alderson sits outside the county and straddles Monroe and Greenbrier Counties. Alderson is provided gas via the Columbia Gas pipeline with which the MVP project would intersect in Monroe County.

Figure 35 – Summers County Natural Gas Pipeline Map



[101] 2013 US Census Bureau 5 Year American Community Survey.

9. Webster

Economic Profile

Webster County is a 556 square-mile county located in the center of West Virginia. It has a population of approximately 8,900 and has a household count of approximately 5,200. The county has had an underperforming economy. Its nominal GDP in 2013 was $297 million or $33,000 per person.[102] The real GDP increased by 2.8% from 2013 to 2014[103] compared to the U.S. GDP real growth of 2.4%[104] during the same time period. Additionally, the county unemployment rate has been high – 11.3% in 2014 compared to 6.5% in West Virginia and 6.2% nationally.

Webster Springs is the largest town with a population of 776 and is also the county seat. Cowen is the second largest town in the county with a population of 541. Together these towns represent approximately 15% of the county's population.

Overall, the economic development in the county has been scattered. There is no major interstate that runs through the county. As such, infrastructure is primarily available along the Route 20 corridor, which runs from Camden-on-Gauley in the southern part of the county through, Cowen, Webster Springs, nearby Diana, and Cleveland on the northern part of the county.

Webster County has also been limited in terms of usable land for large commercial or manufacturing development. The Monongahela National Forest occupies the southeastern part of the county and Holly River State Park is located in the north of the county. Together, these parks consume about one-third of the county's acreage. The majority of useable raw land is located in the southwestern part of the county where post-mining land sites present possible development opportunities.

The county counted 198 employers in 2013 with total employment of 1,919 or 10 employees per employer.[105] The commercial and government sectors represent 69% of the employment in the county. Tourism represents a large portion of the commercial sector. Another 19% of the employment within the county is in the resources and mining sector, which comprises mainly timber production and coal mining. About 9% of the County residents work in manufacturing (see Table 23).

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[102] National Association of Counties. http://www.uscounties.org/countyTracker/index.html
[103] National Association of Counties. http://www.uscounties.org/countyTracker/index.html
[104] http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm; file "gdp2q15_2nd.xls" Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.
[105] WorkForce WV: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html

Table 23 – Employment in Webster County by Sector[106]

Sector	Employment	Percent of Total Employment
Commercial	775	40%
Government	566	29%
Resources and Mining	373	19%
Manufacturing	181	9%
Construction	24	1%
Total	1,919	100%

Wood and lumber product manufacturing has a large presence in Webster. Allegheny Wood Products produces oriented strand board for the construction industry. Other companies include Northwest Hardwoods and the Jim C Hamer Company. Table 24 shows the average annual salary by sector.

Table 24 – Annual Average Wages in Webster County by Sector[107]

Sector	Average Annual Wage
Resources and Mining	$71,228
Government	$35,894
Manufacturing	$29,523
Construction	$29,151
Commercial	$23,815
Weighted Average	$37,199

Cowen represents the best opportunity for Webster County to benefit from manufacturing and commercial development derived from the MVP project for the following reasons:

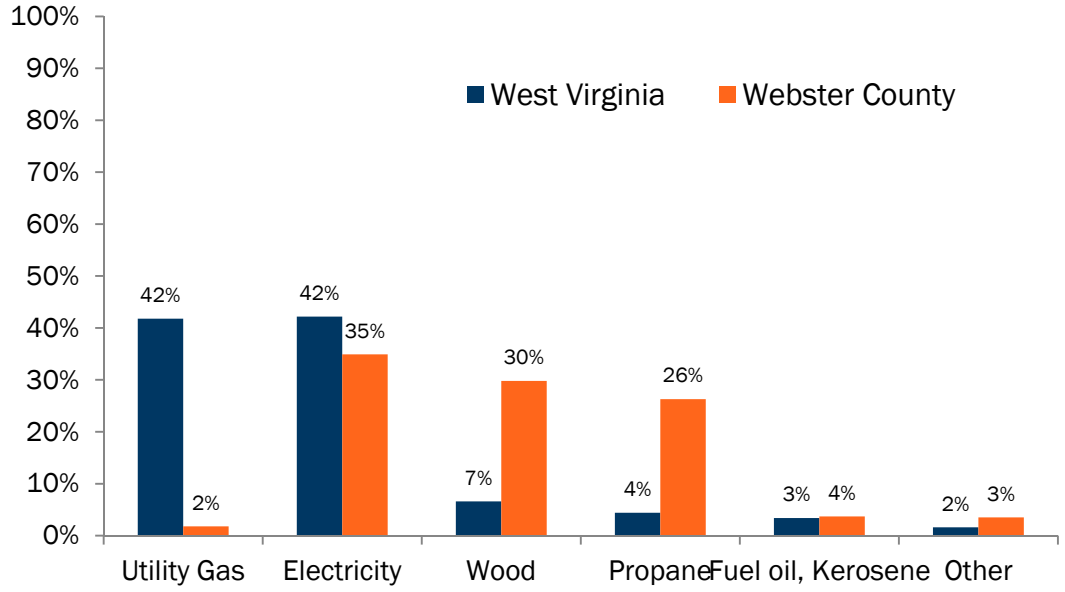
- The proposed MVP pipeline would be nearby (1.2 miles away)
- There are large tracts of usable land for commercial or manufacturing development
- The town has rail service

[106] WorkForce WV: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html
[107] WorkForce WV: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html; FTI analysis.

Energy Profile

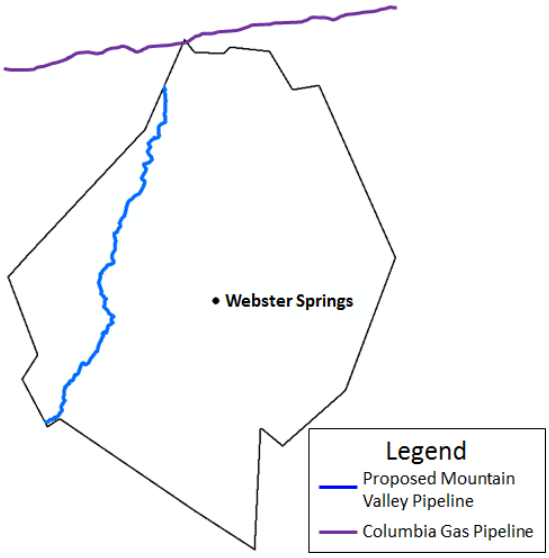
Currently there is no gas service in the county. Electricity, wood, and propane are the main residential home heating sources for the county as shown in Figure 36.

Figure 36 - Primary Space Heating Fuel Used in Webster County versus the State, Percentage of Housing Units[108]



All sectors, particularly in Cowen and Camden-on-Gauly, could benefit from the MVP pipeline as it would run through the western part of the county (Figure 37).

Figure 37 – Webster County Natural Gas Pipeline Map



[108] 2013 US Census Bureau 5 Year American Community Survey.

10. Wetzel

Economic Profile

Wetzel County is a 361 square-mile county located in northern West Virginia. It has a population of approximately 16,200 with a household count of approximately 6,900. Its nominal GDP in 2013 was $435 million or $26,833 per person.[109] The real GDP declined by 1.4% from 2013 to 2014[110] compared to the U.S. GDP real growth of 2.4%[111] during the same time period, although real GDP in Wetzel had grown by 10% the previous year. Additionally, the county unemployment rate has been high – 9.6% in 2014 compared to 6.5% in West Virginia and 6.2% nationally.

New Martinsville is the county seat with a population of 5,300. There is also Paden City with a population of more than 2,500, although the city is split between Wetzel County and Tyler County to the southwest. Together these cities represent approximately 40% of the county's population.

The economic development in the county is diverse. While no large industry is located within the county, many residents work at the nearby Bayer Corporation, PPG Industries (Natrium Plant near New Martinsville) or Ormet Aluminum Corporation. A commerce park is located in New Martinsville which serves as the hub of business activity for the region.

The county counted 419 employers in 2013 with total employment of 4,633 or 11 employees per employer.[112] A large portion of the county employment is in the commercial and government sectors (85%). The Wetzel County Board of Education employs more than 450 workers, and is the largest employer in the county. Only 3% of the County residents work in manufacturing (see Table 25).

Table 25 – Employment in Wetzel County by Sector[113]

Sector	Employment	Percent of Total Employment
Commercial	2,827	61%
Government	1,129	24%
Construction	424	9%
Manufacturing	130	3%
Resources and Mining	123	3%
Total	4,633	100%

[109] National Association of Counties. http://www.uscounties.org/countyTracker/index.html
[110] National Association of Counties. http://www.uscounties.org/countyTracker/index.html.
[111] http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm; file "gdp2q15_2nd.xls" Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.
[112] WorkForce WV: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html
[113] WorkForce WP: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html

Natural gas is important to the county's economic growth. The resources and mining sector (primarily composed of oil and gas sub-sector) has an average annual wage of almost $74,000 or 2.5 times more than the average county wage rate as shown in Table 26.

Table 26 – Annual Average Wages in Wetzel County by Sector[114]

Sector	Average Annual Wage
Resources and Mining	$73,791
Construction	$47,834
Government	$34,831
Manufacturing	$33,630
Commercial	$23,223
Weighted Average	**$29,939**

The drilling activity in Wetzel has led to a boom in government revenue with a large increase in tax revenue. Local property tax revenue has nearly tripled since 2005 with significant increases to severance tax revenue as well.[115]

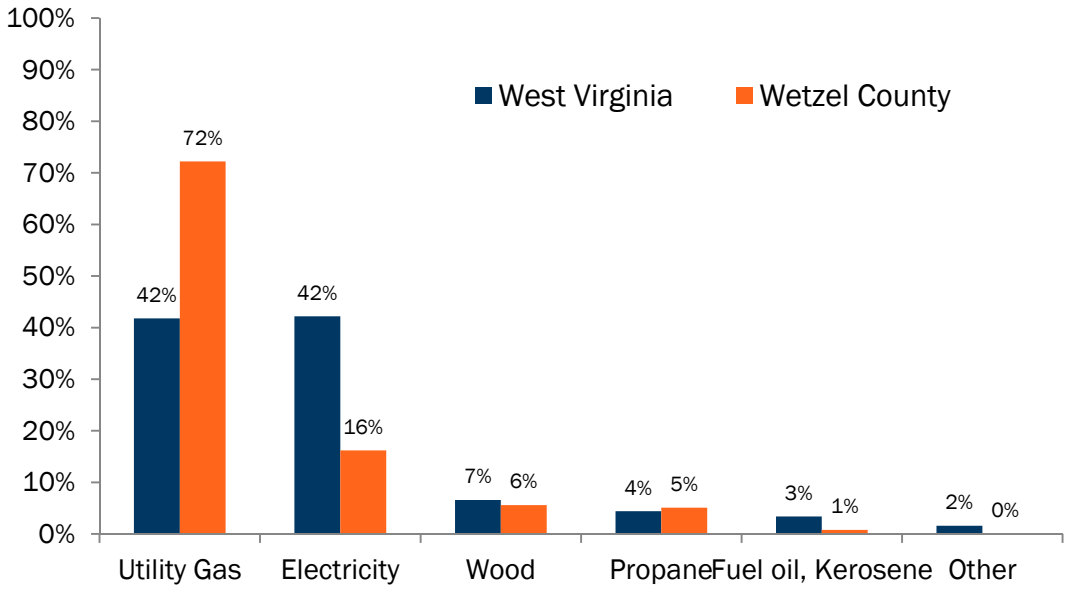
Currently, most of the gas development jobs have gone to out-of-state workers where the industry is more developed and workers are more experienced. Wetzel County could benefit significantly by transitioning out-of-state workers to be re-located within the county. This would provide additional disposable income within the counties borders.

Energy Profile

Oil and gas exploration and development began with the drilling of the first gas well in Hundred in 1886. Oil and gas wells were also developed in Pine Grove, Smithfield, Folsom, and Proctor. Many of these wells continue to be active today. Due to native natural gas production, gas is the primary residential home heating source for the county as shown in Figure 38. Typically commercial and municipal buildings follow the same pattern since natural gas as a fuel choice often is driven by accessibility. Mountaineer Gas Company serves New Martinsville while Dominion Hope serves the rest of Wetzel County.

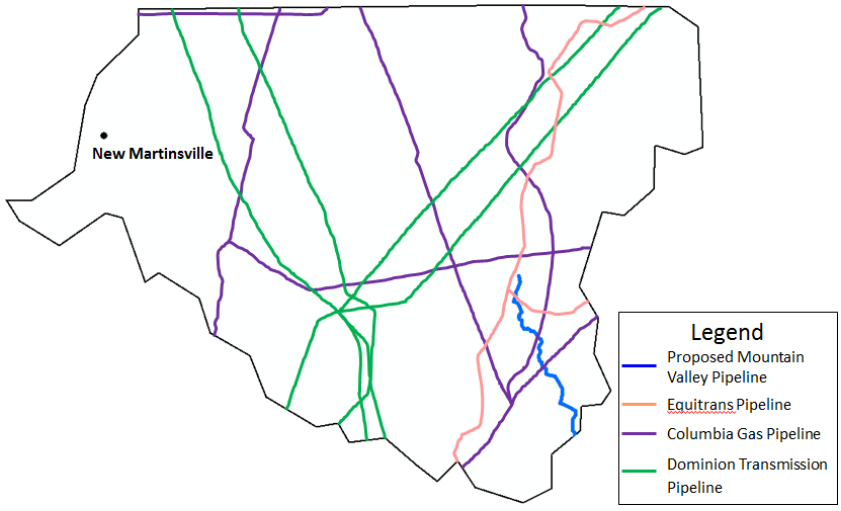
[114] WorkForce WP: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html; FTI analysis.
[115] http://www.wvpolicy.org/wp-content/uploads/2014/04/Impacts-of-Drilling-in-Wetzel-County.pdf

Figure 38 – Primary Space Heating Fuel Used in Wetzel County versus the State, Percentage of Housing Units[116]



The residential, commercial, and municipal sectors could benefit significantly from the MVP pipeline as it would intersect the Columbia Gas and Equitrans pipelines in the southeastern part of the county, as shown in Figure 39. The MVP pipeline, if connected with these pipelines, could provide gas supply to additional Wetzel County consumers.

Figure 39 – Wetzel County Natural Gas Pipeline Map



It is worth noting that New Martinsville has its own electricity generating plant – the hydroelectric facility at Hannibal locks and dam – which produces 37 megawatts.[117]

[116] 2013 US Census Bureau 5 Year American Community Survey.

11. Fayette

Economic Profile

Fayette County is a 668 square-mile county located in the center of West Virginia. It has a population of approximately 45,600 with a household count of approximately 17,000. Its nominal GDP in 2013 was $1.3 billion or $28,500 per person.[118] The real GDP grew by 0.9% from 2013 to 2014[119] compared to the U.S. GDP real growth of 2.4%[120] during the same time period. The county unemployment rate is higher than average – 7.7% in 2014 compared to 6.5% in West Virginia and 6.2% nationally.

Fayetteville is the county seat with a population of 2,900. Oak Hill is the largest city in the county, with a population of 7,700.

The economy of Fayette is diverse. It historically has been a coal mining area, and Kingston Mining is still one of its largest employers. The largest manufacturer is WVA Manufacturing in Alloy, a joint venture between Globe Specialty Metals and Dow Corning, which produces silicon metals. Fayette County also is home to the state's only maximum security prison, Mount Olive Correctional Complex.

The county counted 1,000 employers in 2013 with total employment of 11,525 or 11.5 employees per employer.[121] A large portion of the county employment is in the commercial and government sectors (87%). The Fayette County Board of Education is the largest employer in the county. Only 4% of the County residents work in manufacturing (Table 27).

Table 27 – Employment in Fayette County by Sector[122]

Sector	Employment	Percent of Total Employment
Commercial	6,806	59%
Government	3,233	28%
Resources and Mining	663	6%
Manufacturing	478	4%
Construction	345	3%
Total	11,525	100%

[117] http://www.wvencyclopedia.org/articles/1158
[118] National Association of Counties. http://www.uscounties.org/countyTracker/index.html
[119] National Association of Counties. http://www.uscounties.org/countyTracker/index.html.
[120] http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm; file "gdp2q15_2Nd.xlsx" Table 1 – Real Gross Domestic Product and Related Measures: Percent Change from Preceding Period.
[121] WorkForce WV: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html
[122] WorkForce WP: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html

While the manufacturing sector in Fayette County is relatively small, the average wages are high, As Table 28 shows, manufacturing wages are the second highest across all job sectors in the county ($55,999 per year) and are 59% higher than the average wage in the County.

Table 28 – Annual Average Wages in Fayette County by Sector[123]

Sector	Average Annual Wage
Resources and Mining	$77,720
Manufacturing	$55,999
Government	$36,252
Construction	$32,852
Commercial	$29,285
Weighted Average	**$35,285**

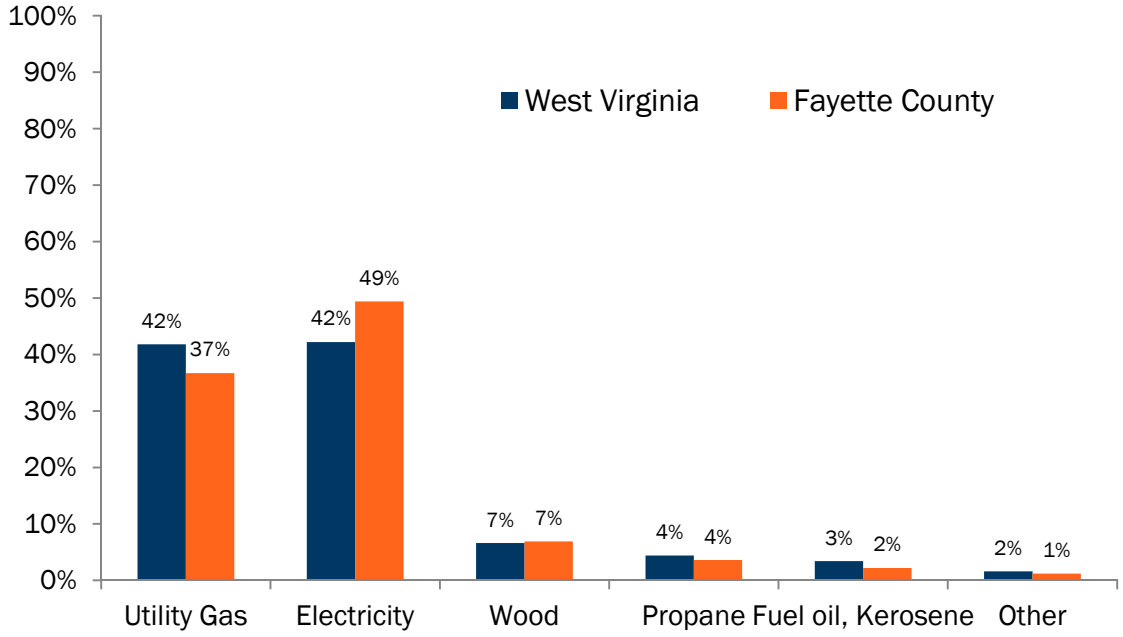
The Resources and Mining sector has the highest wages in the county, representing the historically strong coal mining industry in Fayette.

Energy Profile

There is a significant amount of gas accessibility in Fayette County. Natural gas and electricity are the main residential home heating sources for the county as shown in Figure 40. Typically, commercial and municipal buildings follow the same pattern since natural gas as a fuel choice often is driven by accessibility. Natural gas usage in Fayette County is just below the average for the entire state of West Virginia. Dominion Hope serves the county with natural gas.

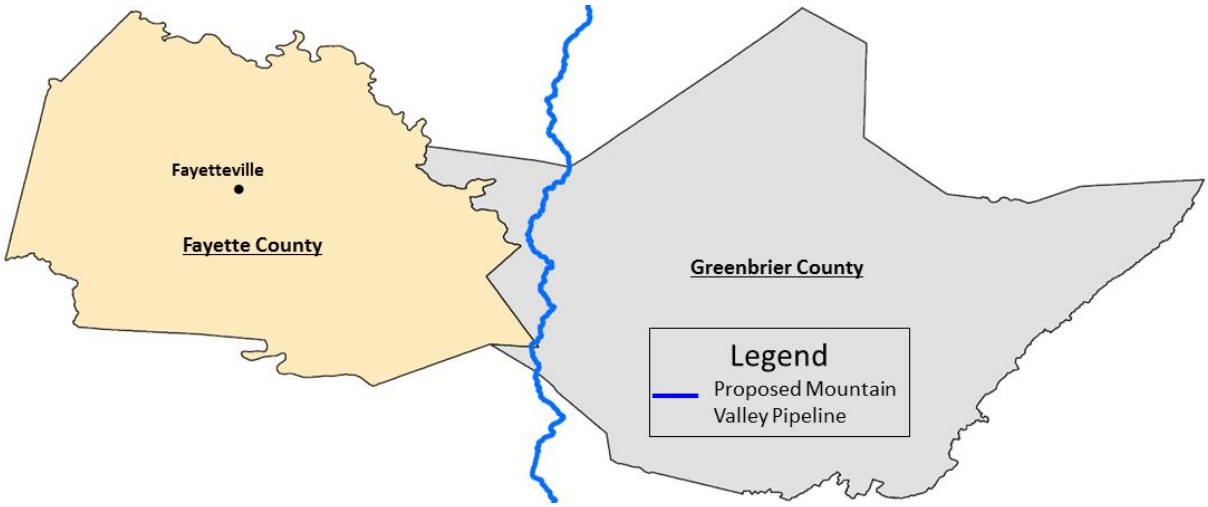
[123] WorkForce WP: http://www.workforcewv.org/lmi/Earnings_N_Wages/EnW.html; FTI analysis.

Figure 40 – Primary Space Heating Fuel Used in Fayette County versus the State, Percentage of Housing Units[124]



The Mountain Valley pipeline is currently planned to traverse the eastern border of the county. Most the towns and businesses are in the central part of the county. The pipeline could expand natural gas supply to the eastern portion of the county, which could enable economic growth in that area (**Error! Reference source not found.**Figure 41).

Figure 41 – Fayette County Natural Gas Pipeline Map



[124] 2013 US Census Bureau 5 Year American Community Survey.

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