
A Review of Changes in Selected Economic & Demographic Indicators in Particular Counties in the Barnett, Fayetteville and Marcellus Shale Play

An Update to The Institute's 2008 Economic Impact Report on the 10th Congressional District

The **INSTITUTE** for
Public Policy & Economic Development

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This research was completed with support from Wilkes University’s Institute for Energy and Environmental Research (IEER) through a grant from the U.S. Department of Energy’s National Energy Technology Laboratory (NETL) and URS Corporation.

Executive Summary

For decades, the 10th Congressional District in Northeastern Pennsylvania (NEPA) has endured sluggish growth; however, the region may soon experience much needed industry revitalization. In recent years, NEPA's population has increased due to strengthened business activity and rising housing prices - a growth gone unobserved for 60 years. While there are various reasons that could contribute to such growth, it seems that the Marcellus Shale formation is the prime factor responsible for that situation.

As a whole, the U.S. produces about 20 Tcf of natural gas per year. The nation's natural gas industry is rapidly increasing. In 2009, the U.S. produced 3,110 billion cubic feet (Bcf) of natural gas from shale — an increase of nearly 1,820 Bcf since 2007. Between 2007 and 2010, shale gas production in Pennsylvania rose from just 1 Bcf to 365 Bcf.¹ This massive production increase is expected to continue for years to come.² The U.S. Energy Department estimates that there is 141 trillion cubic feet (Tcf) of gas in the Marcellus Shale formation.

In 2008, The Institute for Public Policy and Economic Development released a study describing the potential impact the shale formation, or “play,” could have on the economy of Pennsylvania's 10th Congressional District. In this study, The Institute first examined the Barnett Shale in Texas, where the natural gas industry has aided the Dallas/Fort Worth economy in remaining nearly recession-proof. There, production has resulted in \$11.1 billion in annual output, and 100,268 permanent jobs.³ Next, The Institute studied the Fayetteville Shale in Arkansas. Although more recent than the Barnett Shale, the Fayetteville Shale play has already both improved employment and considerably contributed to the state's local economies. Projections indicate that the Fayetteville Shale play will result in major population increases and significant employment gains through 2025.

Finally, The Institute examined the potential effects of NEPA's Marcellus Shale play. When The Institute first examined Marcellus Shale activity in 2008, we reported that 93 drilling permits had been issued and 18 wells drilled in Pennsylvania's Bradford, Lycoming, Susquehanna and Wayne Counties. As an update, as of September 2012, 4,823 drilling permits have been issued and 2,448 wells have been drilled in Bradford, Lycoming, Sullivan, Susquehanna and Wyoming Counties. In 2011, more than 2 Tcf of natural gas production in Bradford, Lycoming and Susquehanna County was reported to the Pennsylvania Department of Environmental Protection.

The Institute has found considerable possibilities beyond which we already have for growth within Pennsylvania's 10th Congressional District, and some counties have already begun to see some of the effects of the Marcellus Shale drilling. Although this exploration is still in early development, the case study comparisons of different regions allow us to conclude that there is definite potential for growth in wealth, employment, and housing within the 10th Congressional District. There are many companies that are currently invested in the growth of the Marcellus Shale and its natural gas supply, but we can only see the effects as more energy companies come to the region. Since the 10th Congressional District is comprised of adjacent counties (non-drilling counties adjacent to drilling counties) in addition to the core counties, there must be considerable strategic economic development initiatives in place to ensure that there is direct economic benefit in addition to any spill over from the core drilling counties.

¹ http://www.eia.gov/dnav/ng/ng_prod_shalegas_s1_a.htm

² <http://www.post-gazette.com/stories/local/state/marcellus-shale-gas-estimate-plummet-219007/>

³ <http://www.fortworthchamber.com/BarnettShaleStudy11.pdf>

Introduction

NEPA has always been a source of economic and industrial change, particularly when observing the coal mining industry and its regional influence. Between the 1850s and 1950s, Pennsylvania coal mining was a keystone of the region's economy helping to propel the industrial revolution and fueling the effort to win two world wars. For decades after coal mining's decline, the region experienced population decreases, and maintained low wages and a depressed job market. Today, NEPA is progressing; population is increasing and businesses are coming into the area. Additionally, the region is faced with the possibility of a new natural resource phenomenon: natural gas found in Marcellus Shale deposits.

As expected, area residents are both curious and concerned about the potential impacts of natural gas drilling. Increasing local and national media attention has focused on area land owners signing over leasing rights to energy companies, the high prices these companies are paying for such rights, potential environmental issues, economic development, less reliance on foreign oil and energy sources and an endless list of other potential opportunities and issues.

Published in May 2008, The Institute's original study evaluated the prospective impact of land leasing and drilling of Marcellus Shale deposits, with particular emphasis on the impact to the financial industry. It also examined other regions in the U.S that have been affected by natural gas plays. Using publicly available data The Institute examined the possibility of Marcellus Shale deposits in the counties comprising Pennsylvania's 10th Congressional District (see description and changes as a result of redistricting on page 22).

This document provides an update to our original study, based on newly recorded data. Furthermore, it utilizes case study methodology to compare some area demographic and economic indicators in NEPA with other regions in the country that have already experienced the advent of shale gas industry.

Research Methods & Limitations

This report uses secondary data from federal, private, state and non-profit sources. The report uses data from the US Census Bureau, the Internal Revenue Service, US Bureau of Labor Statistics, Pennsylvania Department of Environmental Protection, and Texas Railroad Commission. Data is footnoted and labeled throughout the paper. This report is limited to an explanation of the data and trends. General Internet searches were completed to identify potential significant events in the communities researched. No claim is made that natural gas drilling is the complete and sole reason for economic growth in any region. There is no economic analysis of the impact of the recession on any of the communities presented in this paper.

CASE STUDIES

THE IMPACT OF OTHER UNCONVENTIONAL SHALE GAS BASINS THROUGHOUT THE U.S.

These case studies examine the economic impact of various types of natural gas producing shale. The purpose is to reveal the natural gas industry's potential impact on NEPA. Although case studies do not allow us to make an exact assumption or prediction of what will occur in NEPA, they offer a glimpse into possibilities and demonstrate lessons learned.

Case Study: BARNETT SHALE & DENTON COUNTY, TEXAS

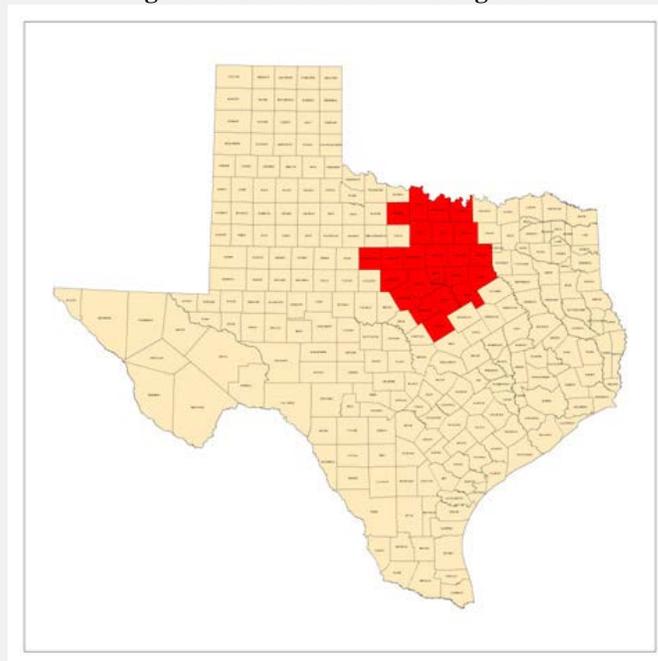
BARNETT SHALE

The Barnett Shale, located in the Dallas/Fort Worth area, is a hydrocarbon-producing geological formation of great economic significance. Discovered in 1981 by Mitchell Energy, it is underlain by sedimentary rock. The productive part of the formation is estimated to stretch west and south from the City of Dallas, covering 5,000 square miles and at least eighteen counties.⁴ It is the nation's second largest producing on-shore domestic natural gas field, and one of the country's largest gas production regions.

According to an economic impact analysis of the Barnett Shale, total natural gas production has grown sharply in recent years and, in 2011, accounted for 31 percent of the state's total production, a 19 percent increase from 2006. The development has produced a substantial number of businesses, leading to the creation of jobs and economic opportunities for thousands of area residents and companies. Additionally, retail sales taxes, occupancy taxes, and other sources of fiscal revenue have increased, as the enhanced level of aggregate performance spans a broad spectrum of sectors.⁵

According to the Texas Railroad Commission (the independent state agency that regulates Texas' energy industry, including the Barnett Shale drilling), the Barnett shale play encompasses four core counties, including Denton, Johnson, Tarrant and Wise, and 21 non-core counties. There are 24 counties with producing wells, as presented below and 25 counties where permits are issued.

Figure 1: Counties with Existing Wells



Source: Texas Railroad Commission

⁴ <http://www.rrc.state.tx.us/barnettshale/index.html>

⁵ Bounty from Below

Economic Impact

Activity in the Barnett Shale generates billions of dollars in investments and thousands of jobs. Royalty and bonus payments to area residents, cities, school districts, and others continue to rise, as do property tax receipts to local taxing authorities. Texas production has since resulted in \$11.1 billion in annual output, and 100,268 permanent jobs.⁶ The Fort Worth Chamber of Commerce estimates that the Barnett Shale activity is responsible for approximately 38.5 percent of the area's growth over the past decade.⁷

Improvements in recovery techniques have provided an ample increase in activity over the past several years. Figure 2 demonstrates the Barnett Shale's rapid production growth over a nineteen-year period.

In 2011, it was estimated that counties, cities, and school districts received \$730.6 million in additional fiscal revenues due to the Barnett Shale activity. Counties in the Barnett Shale area have seen a 1,642 percent increase in fiscal revenues between 2001 and 2011.⁸ In addition, it was estimated that the state received an additional \$911.8 million in taxes. The total gain in state and local tax revenue due to the Barnett Shale activity is estimated to be \$1.6 billion.⁹

The overall effects of the Barnett Shale activity are likely to account for an average of more than 108,000 jobs and \$10.4 billion in output per year through 2015. Such impacts are noteworthy, even in the region's large and diverse economy.

The Barnett Shale natural gas industry has had a ripple effect on many business activities, including, for example, the creation of 100,268 jobs.¹⁰ The industry has also increased gross product and personal income. The Fort Worth Chamber of Commerce estimates that the Barnett shale adds \$11.1 billion in annual output to the region. Personal income across the Barnett Shale area is 8.5 percent higher than it would be without the shale activity.¹¹

⁶ <http://www.fortworthchamber.com/BarnettShaleStudy11.pdf>

⁷ Ibid.

⁸ Ibid.

⁹ Ibid.

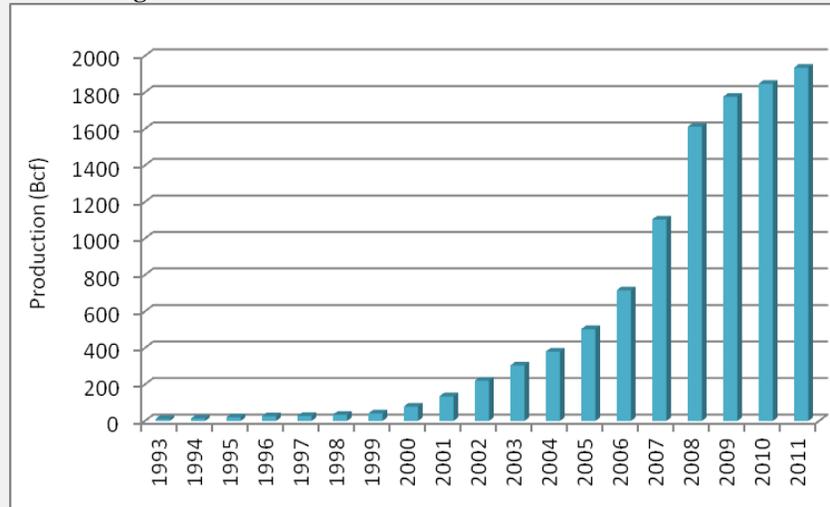
¹⁰ <http://www.fortworthchamber.com/BarnettShaleStudy11.pdf>

¹¹ Ibid.

Drilling and Production

Production in the Barnett Shale has grown significantly since 1990. In 2011, over 1,900 Bcf of natural gas were produced. Like the Marcellus Shale, the Barnett Shale activity includes both horizontal and vertical wells.

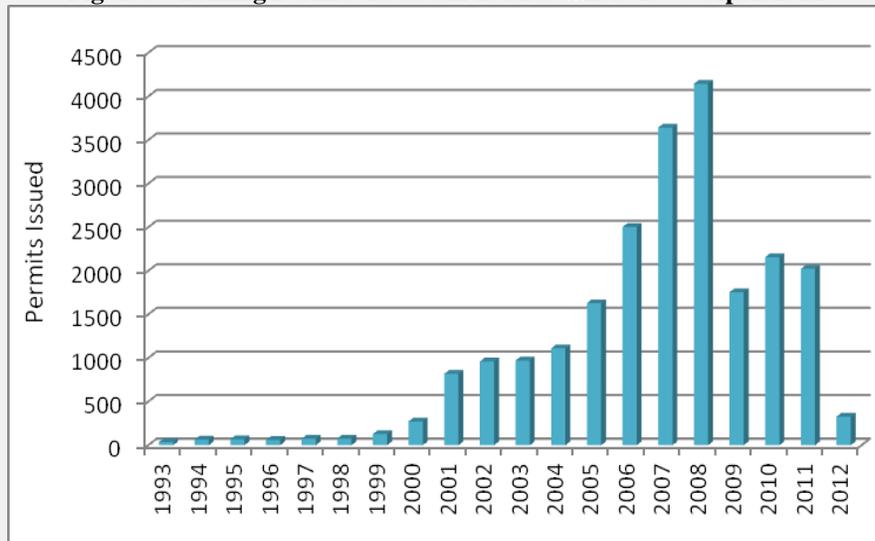
Figure 2: Barnett Shale Gas Well Production 1993-2011



Source: Texas Railroad Commission

The number of permits issued hit an all-time high in 2008, but began to drop in 2011 as exploration and production slowed down due to the low price for gas. More broadly, natural gas drilling in all shale plays has decreased (during 2012) due to the low price of natural gas in the market. As U.S. demand for natural gas increases, due to increased use of natural gas fueled vehicles, fueling stations, business and residential conversions, pipeline system expansions and potential exports of liquefied natural gas, such demand will cause the price to rise and drilling activity to increase.

Figure 3: Drilling Permits Issued in Barnett Shale 1993- April 2012



Source: Texas Railroad Commission

DENTON COUNTY, TEXAS

Denton County is part of the Dallas/Fort Worth, Texas, metropolitan area. It is a reasonably sized county that has encountered incredible growth since the mid-nineties, when the Barnett Shale was introduced. This county is used as a case study because of its similarities to the collective group of counties located within Pennsylvania's 10th Congressional District.

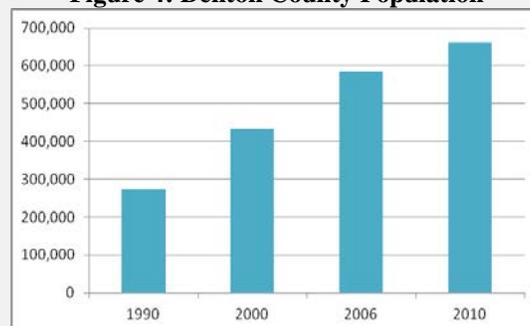
In 2000, Denton County's population was 432,976. In 2010, Denton County's population increased to 662,614, a 53 percent increase over 2000.¹² In addition to state and local regulations facilitating natural gas drilling and production, a variety of factors contributed to Denton County's significant growth. Denton County is part of the Dallas-Fort Worth metro area and therefore benefits from the attributes of the cities and their surrounding growth.

This case study examines Denton County's population, economic, and social data at four time periods: 1990, 2000, 2006, and 2010 – the most recent data available.

Population

The Barnett Shale has greatly contributed to Denton County's growing population, which has more than doubled since 1990.

Figure 4: Denton County Population

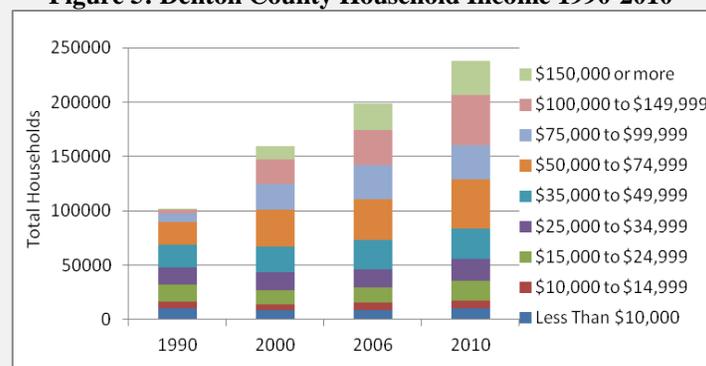


Source: US Census Bureau

Income

Denton County experienced remarkable growth in median household income, with the greatest increase occurring in the \$100,000 - \$149,999 income range. In 1990, just three percent of households in the county fell into this income bracket, and by 2010, that rose to more than nineteen percent.

Figure 5: Denton County Household Income 1990-2010

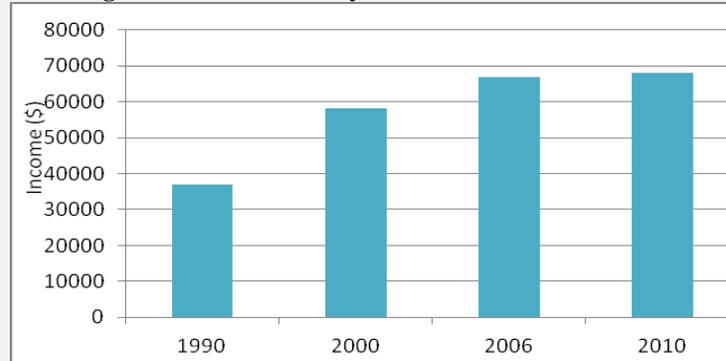


Source: US Census Bureau

¹² 2010 Census

The county’s median income also grew, reaching nearly \$70,000 in 2010 – almost double that in 1990. In 2000, Denton County’s median income was \$58, 216, which increased by 20 percent between 2000 and 2010.

Figure 6: Denton County Median Income 1990-2010



Source: US Census Bureau

Denton County residents saw a 386 percent increase in wages and salaries between 1990 and 2009. Dividends before exclusions grew by 393 percent and interest by 56 percent.

Table 1: Denton County Tax Return Data 1990 – 2009

	Number of Returns	Number of Exemptions	Adjusted Income	Wages & Salaries	Dividends Before Exclusions	Interest Received	Gross Rent & Royalties
1990	92,235	219,385	\$3,432,829	\$3,005,711	\$29,004	\$151,178	89,091
2000	163,704	373,348	\$10,831,294	\$9,019,378	\$110,453	\$198,085	168,374
2005	209,681	488,001	\$14,171,829	\$12,072,937	\$123,211	\$182,459	N/A
2009	247,679	576,006	\$16,970,898	\$14,619,805	\$142,951	\$235,428	N/A
Percentage Change 2000-2009	168.5%	162.5%	394.4%	386.4%	392.8%	55.7%	N/A

(Not in thousands)

|(In thousands)

Source: IRS

Employment

In the 20-year time span examined, the county’s labor force doubled from 169,309 in 1990 to 376,227 in 2010. While the county’s unemployment rate increased to 7.3 percent in 2010 due to the economic recession, it remained more than two percentage points less than the 2010 national average.

Table 2: Denton County Employment 1990-2010

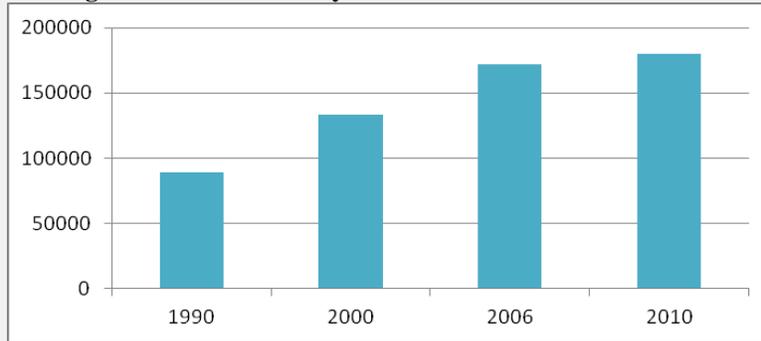
	1990	2000	2006	2010
Labor Force	169,309	248,592	336,939	376,227
Employment	162,249	239,154	317,016	348,902
Unemployment	7,060	9,438	19,923	27,325
Unemployment Rate	4.2%	2.90%	5.90%	7.30%

Source: US Census Bureau

Housing

Denton County's number of owner-occupied housing units soared from 48,766 in 1990 to 135,650 in 2006 – a 178 percent increase. In 2010, the county recorded a total of 156,864 owner-occupied homes, an increase of 222 percent since 1990. Median home values also increased significantly over the time period examined.

Figure 7: Denton County Median Home Values 1990-2010



Source: US Census Bureau

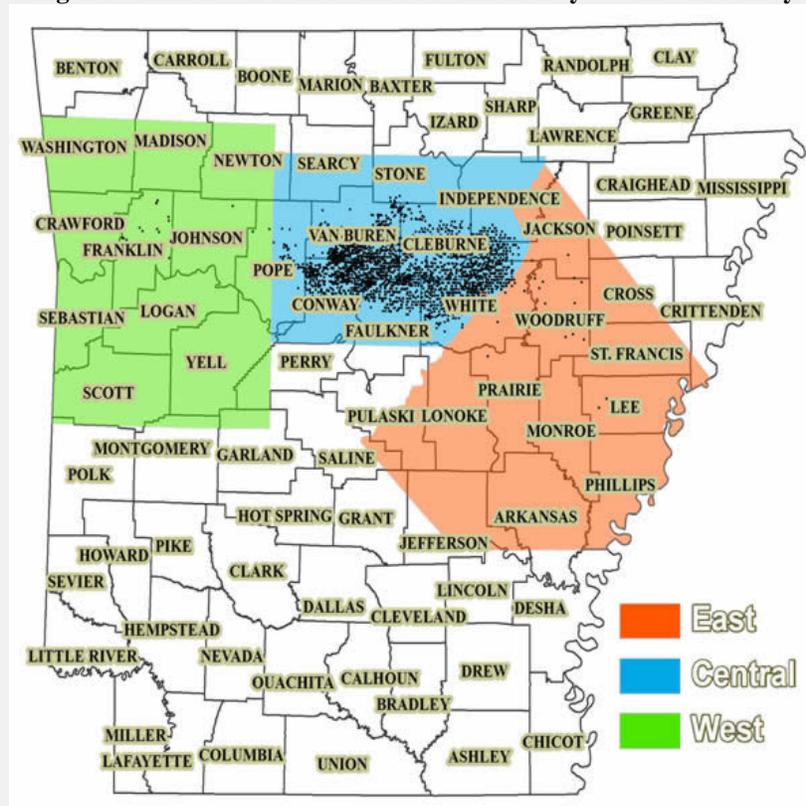
Case Study:

FAYETTEVILLE SHALE & FAULKNER COUNTY, ARKANSAS / WHITE COUNTY, ARKANSAS

FAYETTEVILLE SHALE

The Fayetteville Shale provides for an unusual natural gas reservoir situated on the Arkansas side of the Arkoma Basin, ranging in thickness from 50 to 325 feet and in depth from 1,500 to 6,500 feet. Direct economic activity connected with the development of the Fayetteville Shale includes exploration, extraction, production, transportation, storage and distribution.¹³

Figure 8: Arkansas Counties Involved in the Fayetteville Shale Play



Source: Geology.com

The Fayetteville Shale is a recently tapped natural gas source. The "sweet spot," where geologists believe the rock holds the greatest natural gas reserve, spans five central Arkansas counties, including Cleburne, Conway, Faulkner, Van Buren and White.¹⁴ In 2002, Houston-based Southwestern Energy began natural gas exploration in Arkansas. The company holds mineral rights on 925,842 acres of the Fayetteville Shale land. In 2011, the company's net production in the Fayetteville Shale play was 436.8 Bcf. In 2012, the company will invest \$1.1 billion to develop more wells within this play.¹⁵

¹³ Arkansas Oil and Gas Commission

¹⁴ <http://cleburnecountyarkansas.com.hosting.domaindirect.com/id10.html>

¹⁵ <http://www.swn.com/operations/Pages/fayettevilleshale.aspx>

According to a University of Arkansas study, “Exploration and production activities related to the Fayetteville Shale from 2008 to 2011 generated more than \$18.5 billion in total economic activity. Total annual state employment from Fayetteville Shale activity increased from 14,500 to more than 22,000 from 2008 to 2011.”¹⁶

The study indicates that the play resulted in nearly \$2 billion in state and local permit fees and taxes collected. Specifically, the study stated, “4,878 drilling permits were issued in Fayetteville Shale counties by the Arkansas Oil and Gas Commission, generating fees to the state of almost \$1.5 million, and the state received more than \$90.8 million in severance tax revenues from activity in the region.”¹⁷

In the 2001 to 2010 time period, 818 new business establishments were created in Arkansas’ Faulkner County. Between 2006 and 2011, local taxable sales increased 23.3 percent, compared with the state increase of only 5.7 percent.¹⁸

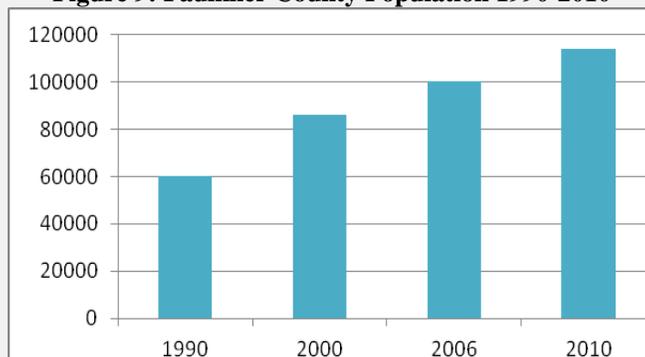
FAULKNER COUNTY, ARKANSAS

Faulkner County’s largest industries by employment include: trade, transportation, and utilities (18.2 percent); government (16.9 percent); education and health services (15.2 percent); and professional and business services (14.8 percent). Between September 2010 and September 2011, the county’s mining and natural resources industry created 738 new jobs. In February 2012, Faulkner County had an unemployment rate of 7.5 percent, which was considerably less than the state’s average unemployment rate of 8.3 percent in that same month.¹⁹

Population

Between 1990 and 2010, Faulkner County’s population increased by nearly 90 percent. As of July 2011, 116,342 people live in Faulkner County, an increase of about a 35 percent since 2000.²⁰

Figure 9: Faulkner County Population 1990-2010



Source: US Census Bureau

Income

Faulkner County experienced an incredible increase in household income. From 1990 to 2010, the number of residents falling within the county’s \$100,000 to \$149,999 income bracket grew 175 percent.²¹ In addition, median income also rose from \$23,663 in 1990 to \$43,033 in 2010.

¹⁶ <http://newswire.uark.edu/article.aspx?id=18558>

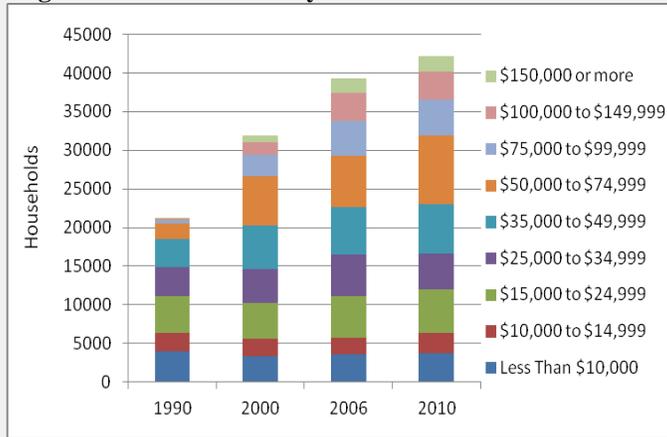
¹⁷ Ibid

¹⁸ <http://www.swn.com/operations/Pages/fayettevilleshale.aspx>

¹⁹ Ibid.

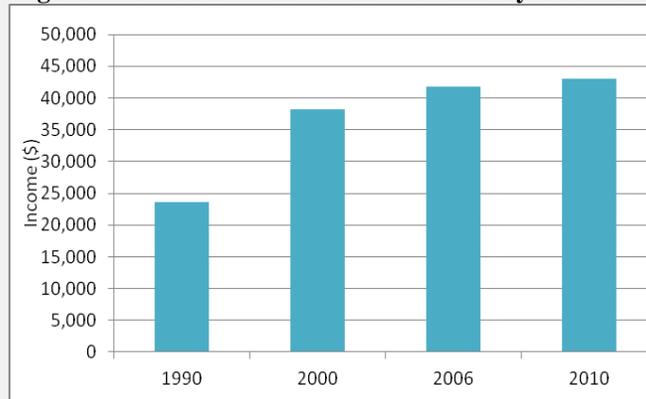
²⁰ Ibid

Figure 1: Faulkner County Household Income 1990-2010



Source: US Census Bureau

Figure 112: Median Income Faulkner County 1990-2010



Source: US Census Bureau

Wages and salaries increased by 261 percent between 1990 and 2009.

Table 5: Faulkner County Tax Return Data

	Number of Returns	Number of Exemptions	Adjusted Income	Wages & Salaries	Dividends Before Exclusions	Interest Received	Gross Rents & Royalties
1990	20,814	49,635	\$551,153	\$449,095	\$4,930	\$29,262	\$18,903
2000	32,498	74,563	\$1,376,962	\$1,099,476	\$14,083	\$37,050	\$30,045
2005	35,624	80,670	\$1,680,270	\$1,314,348	\$15,889	\$27,603	N/A
2009	40,679	90,790	\$2,021,964	\$1,623,114	\$12,418	\$30,436	N/A
Percentage Change 1990-2009	48.8%	82.9%	266.8%	261.4%	151.8%	4%	N/A

(Not in thousands)

(In Thousands)

Source: IRS

²¹ Census Bureau

Employment

The county's labor force nearly doubled over the 20 years examined, from 31,913 in 1990 to 57,416 in 2010. Although it remains below the 8.3 percent state average and 9.6 percent national average, the county's unemployment rate grew to 7.5 percent in 2010. Faulkner County has reported increased retail, hotel and restaurant sales directly related to shale development.²²

Table 6: Faulkner County Employment Data

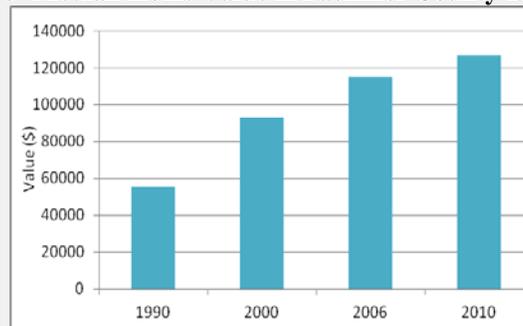
	1990	2000	2006	2010
Labor Force	31,913	45,335	49,014	57,416
Employment	29,618	43,704	46,615	53,088
Unemployment	2,295	1,631	2,399	4,328
Unemployment Rate	7.2%	3.6%	4.9%	7.5%

Source: US Census Bureau

Housing

Along with increased employment and incomes, the county's home values also rose. Between 1990 and 2010, Faulkner County's median home value more than doubled.

Figure 3: Median Home Value in Faulkner County 1990-2010



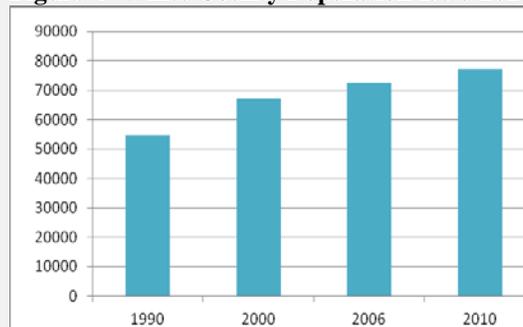
Source: US Census Bureau

WHITE COUNTY, ARKANSAS

Population

Due to the Fayetteville Shale activities, Arkansas' White County has experienced some of the same effects detailed in the previous case study. Between 1990 and 2010, the county's population grew from 54,676 to 77,350 – a nearly 42 percent increase.

Figure 4: White County Population 1990-2010



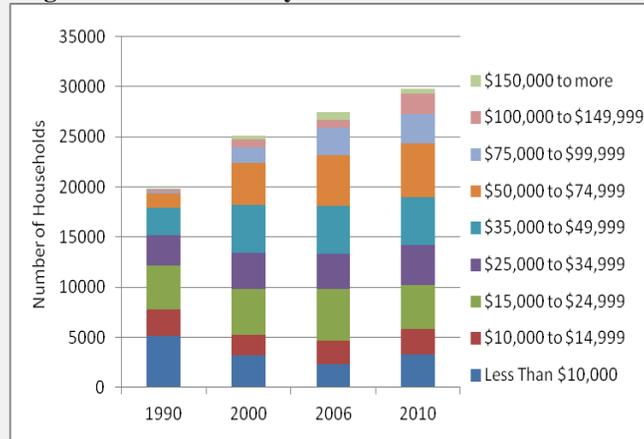
Source: US Census Bureau

²² http://cber.uark.edu/Revisiting_the_Economic_Impact_of_the_Fayetteville_Shale.pdf

Income

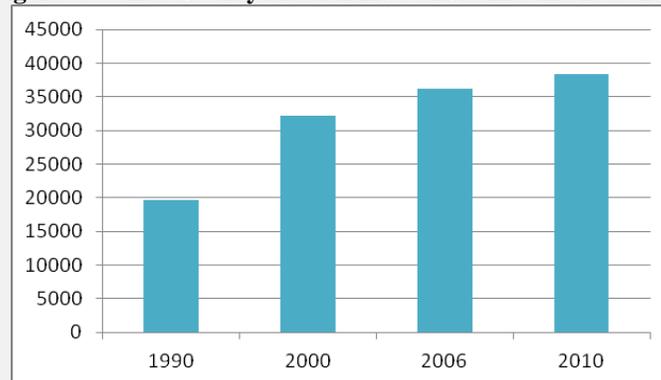
White County also experienced a rise in income over the period studied. The following graph shows a rise in households, as well as in household income from 1990 through 2010. Significant is that, between 1990 and 2010, the number of households earning \$34,999 and less decreased.

Figure 5: White County Household Income 1990-2010



Source: US Census Bureau

Figure 6: White County Median Household Income 1990-2010



Source: US Census Bureau

Also between 1990 and 2009, White County's wages and salaries increased by 161 percent and adjusted gross incomes grew by 169 percent.

Table 7: White County Tax Return Data

	Number of Returns	Number of Exemptions	Adjusted Income	Wages & Salaries	Dividends Before Exclusions	Interest Received	Gross Rents & Royalties
1900	19,351	46,191	\$442,316	\$350,362	\$4,561	\$30,186	\$14,399
2000	22,493	51,458	\$787,262	\$608,403	\$8,543	\$31,430	\$24,006
2005	24,962	57,802	\$983,765	\$754,359	\$11,254	\$22,499	
2009	27,277	62,316	\$1,187,893	\$913,855	\$9,592	\$27,403	N/A
Percentage Change 1990-2009	40.9%	34.9%	168.5%	160.8%	110.3%	-61%	N/A

(In thousands)

|(Not in thousands)

Source: IRS

Employment

The county's labor force nearly doubled from 26,310 in 1990 to 35,478 in 2010, while its unemployment rate decreased to 4.6 percent in 2010 – which represents half of the county's unemployment rate in 1990 and half the U.S. rate in 2010.

Table 8: White County Employment Data

	1990	2000	2006	2010
Labor Force	26,310	30,893	34,261	35,478
Employment	23,772	29,436	32,493	32,572
Unemployment	2,528	1,457	1,768	2,788
Unemployment Rate	9.60%	4.70%	5.20%	4.60%

Source: US Census Bureau

Housing

Although White County reported a slight decline in home values between 2006 and 2010, overall, home values increased significantly since 1990.

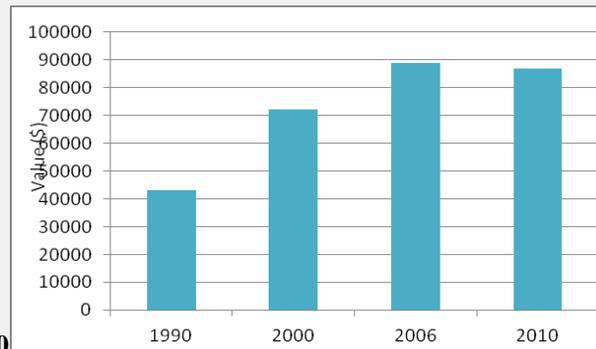


Figure 7: White County Median Home Values 1990-2010

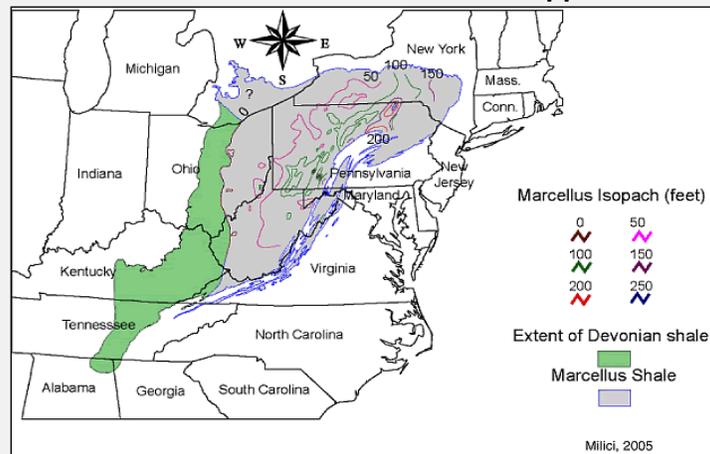
Source: US Census Bureau

Impact on Northeastern Pennsylvania

Past studies by the U.S. Geological Survey determined that the Marcellus Shale contains an estimated undiscovered resource of about 1.9 Tcf.²³ More recent estimates indicate that 141 Tcf of natural gas can be recovered from the formation.²⁴

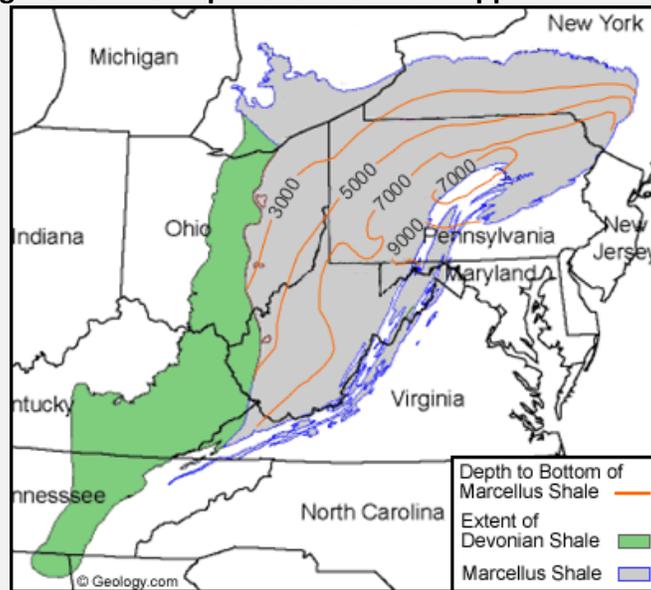
Figures 17 and 18 below show the extent and depth of the Marcellus Shale in New York, Ohio, Pennsylvania and West Virginia.

Figure 87: The Distribution of Shale in the Appalachian Basin



Source: AAPG

Figure 18: The Depth of Shale in the Appalachian Basin



Source: AAPG

²³ <http://geology.com/articles/marcellus-shale.shtml>

²⁴ <http://www.bloomberg.com/news/2012-01-23/u-s-reduces-marcellus-shale-gas-reserve-estimate-by-66-on-revised-data.html>

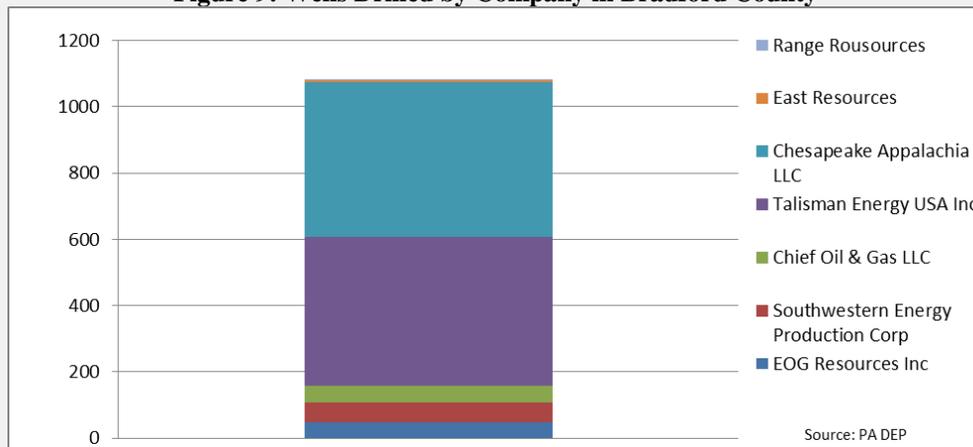
Wells

Since The Institute last studied the Marcellus Shale, major industry growth has occurred. In 2008, there were a handful of wells drilled in the region; today, there are hundreds.

The following section details the top five companies operating in each county and the number of wells they are operating as of July 2012. All data were retrieved from the Pennsylvania Department of Environmental Protection.

Bradford County contains the most wells drilled of any county in Pennsylvania's 10th Congressional District. Chesapeake Appalachia, LLC operates 468 of the county's 1,084 wells.

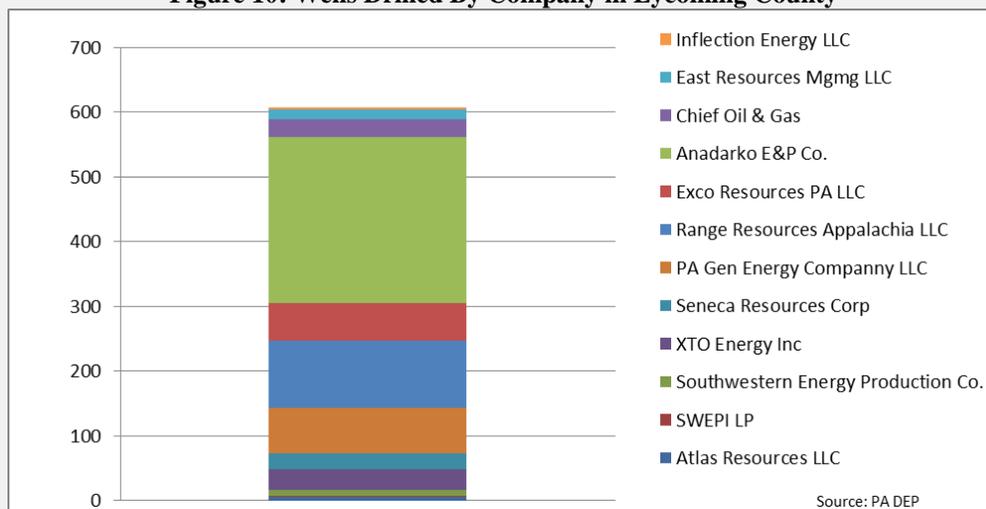
Figure 9: Wells Drilled by Company in Bradford County



Source: PA DEP

Anadarko Exploration and Production Company operates 257 of Lycoming County's 607 wells, which makes Anadarko the county's leading driller.

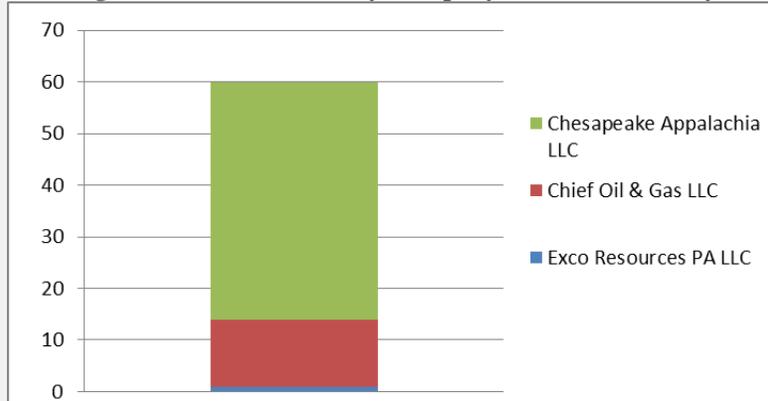
Figure 10: Wells Drilled By Company in Lycoming County



Source: PA DEP

Chesapeake Appalachia, LLC operates 46 of 60 wells in Sullivan County, making it the county's top operator.

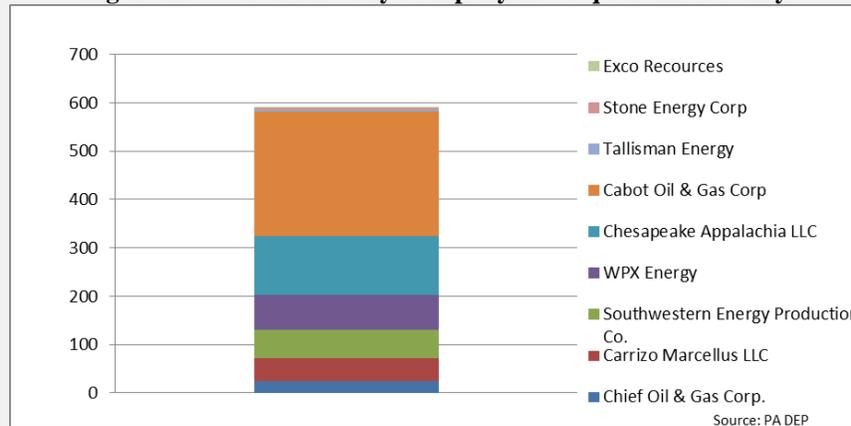
Figure 11: Wells Drilled By Company in Sullivan County



Source: PA DEP

Cabot Oil & Gas Corp is Susquehanna County's top driller. Cabot drilled 257 of the county's 590 wells.

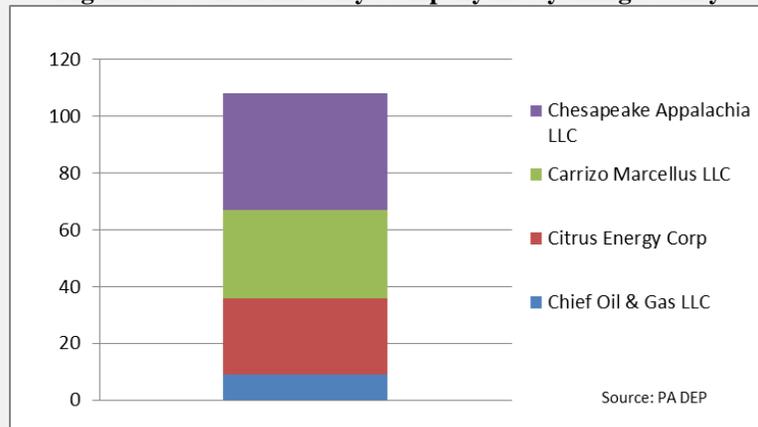
Figure 12: Wells Drilled By Company in Susquehanna County



Source: PA DEP

In Wyoming County, Chesapeake Appalachia, again, operates the most wells. The company drilled 41 of the county's 108 wells.

Figure 13: Wells Drilled By Company in Wyoming County

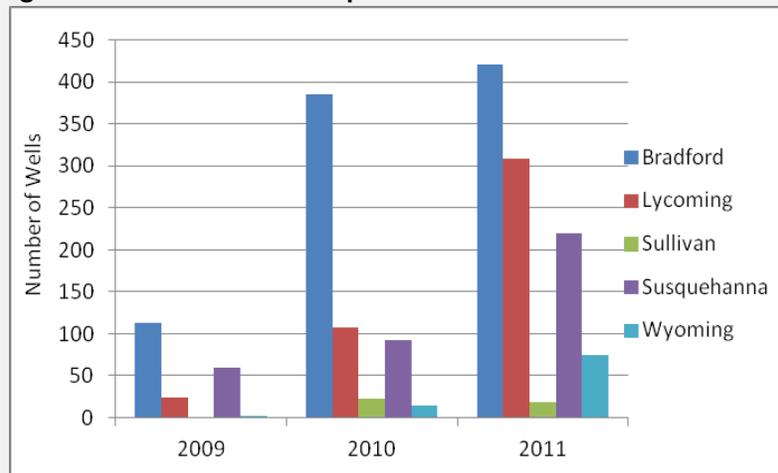


Source: PA DEP

Over the past three years, there has been tremendous growth in both the number of wells drilled and the number of drilling permits issued in the 10th Congressional District. Bradford County has the highest numbers in both categories, but Lycoming and Susquehanna Counties have shown impressive growth. In 2008, Pennsylvania imported 75 percent of its natural gas.

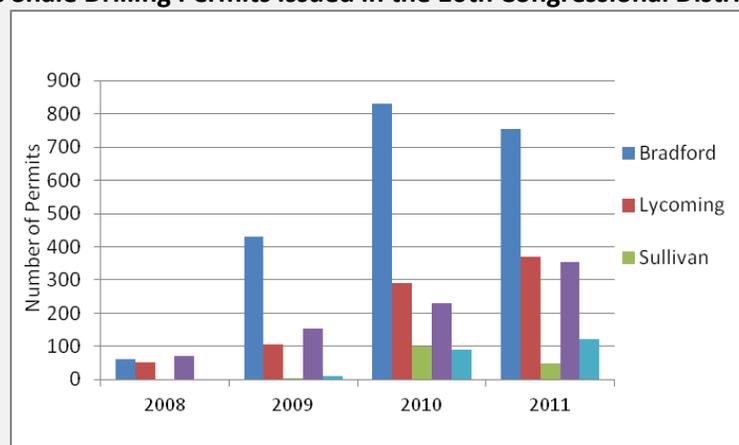
The Pennsylvania Independent Oil and Gas Association predicts that by 2014, the state will be a net exporter of natural gas.²⁵ The association also estimates that Marcellus Shale activity added \$10.1 billion in total economic output and \$1 billion in tax revenue throughout Pennsylvania in 2011.²⁶

Figure 14: Wells Drilled in Top 5 Counties in the District 2009-2011



Source: Pittsburgh Today

Figure 15: Marcellus Shale Drilling Permits Issued in the 10th Congressional District 2008-2011



Source: Pittsburgh Today

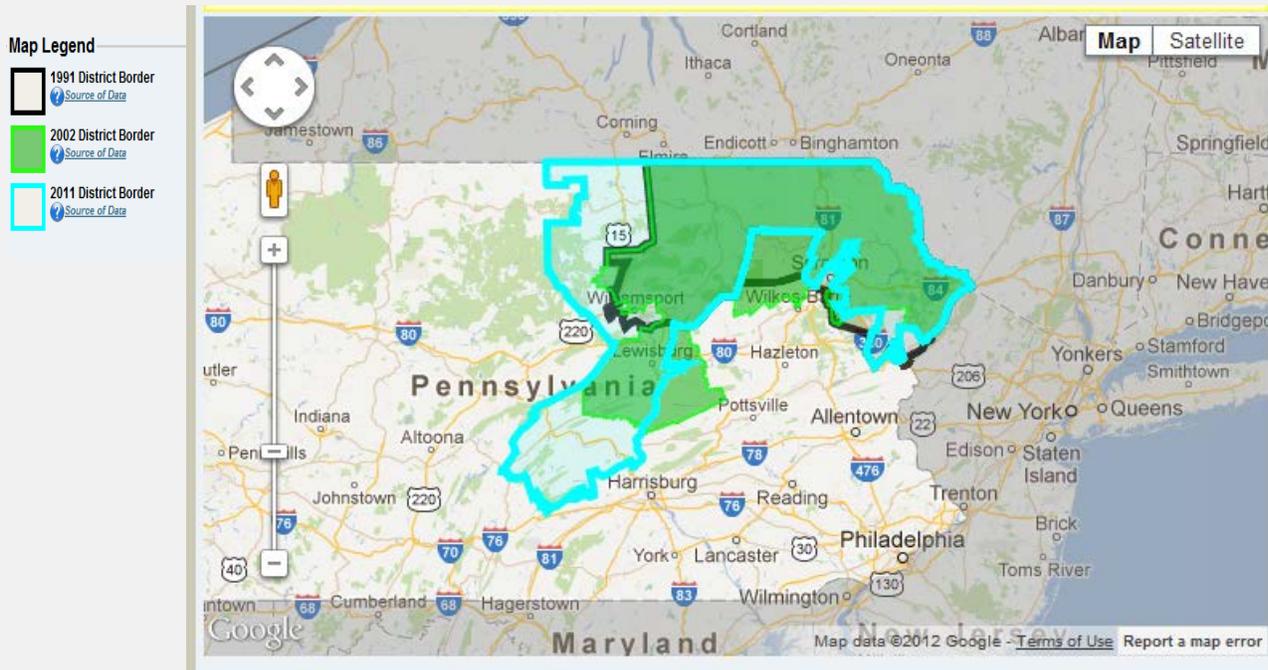
²⁵ <http://www.pioga.org/marcellus-shale/>

²⁶ <http://www.pioga.org/marcellus-shale/>

Study Area

Since The Institute last examined the 10th Congressional District's demographic and income data, some redistricting has occurred throughout the years. Although many of the same counties are located in the district, as indicated on the map below, the 2000 Census expanded the district slightly and the 2010 Census will expand it even further. The data presented are from the 2010 Census and are, therefore, compared with historical data published in this report from the 2002 district geography.

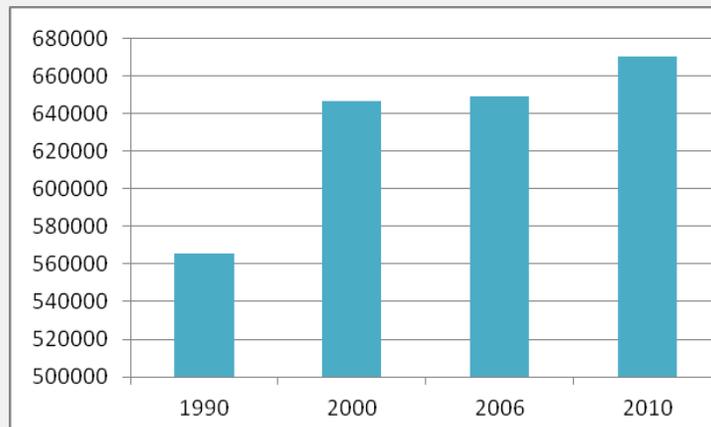
Figure 16: 10th Congressional District Changes as a Result of the Census



Population

The population statistics below reflect an 18 percent increase for the entire 10th Congressional District from 1990 to 2010. It may be assumed that such increase is due to an increase in job availability — attributable to the new industry. Also, natural gas exploration produced numerous ancillary jobs, and, given that re-districting between the 1990 and 2000 Censuses essentially changed the composition of the 10th Congressional District, the change from 2000 to 2006 is negligible. In the four years between 2006 and 2010, however, the district's population increased 3 percent — from 649,330 to 670,356.

Figure 27: 10th Congressional District Population 1990-2010

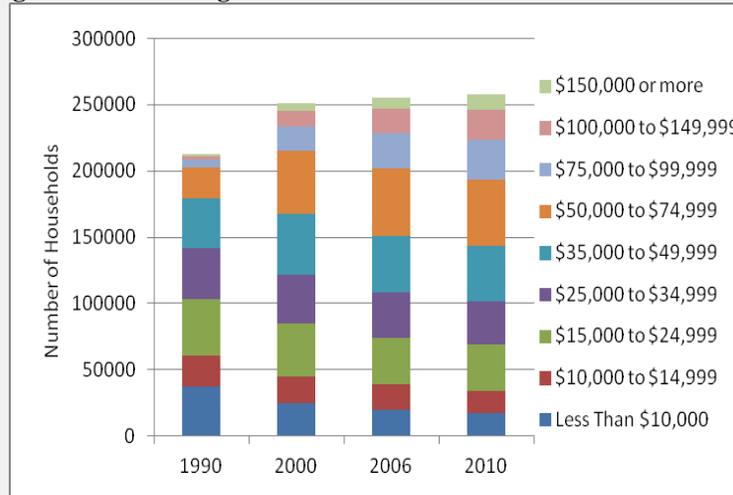


Source: US Census Bureau

Income

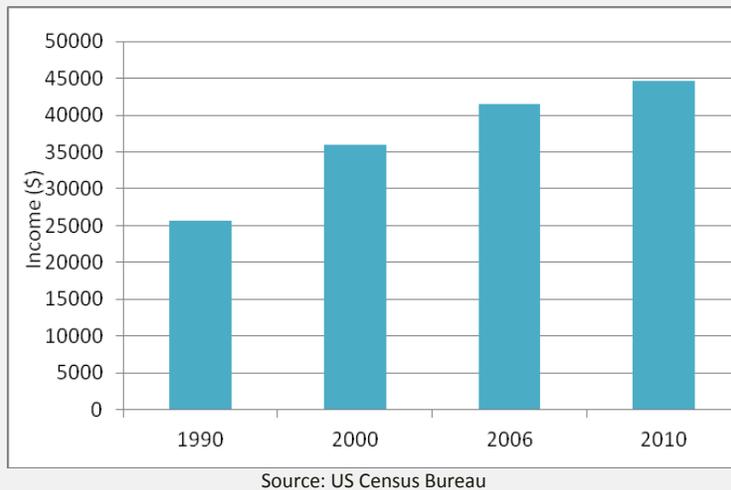
Household income also increased within this period. In 2010, there were more than five times as many households with incomes of \$150,000 or more than in 1990. During the same period, the district’s median income grew from \$25,648 to \$44,684 – a 74 percent increase. Households earning less than \$34,999 decreased during the period.

Figure 28: 10th Congressional District Household Income 1990-2010



Source: US Census Bureau

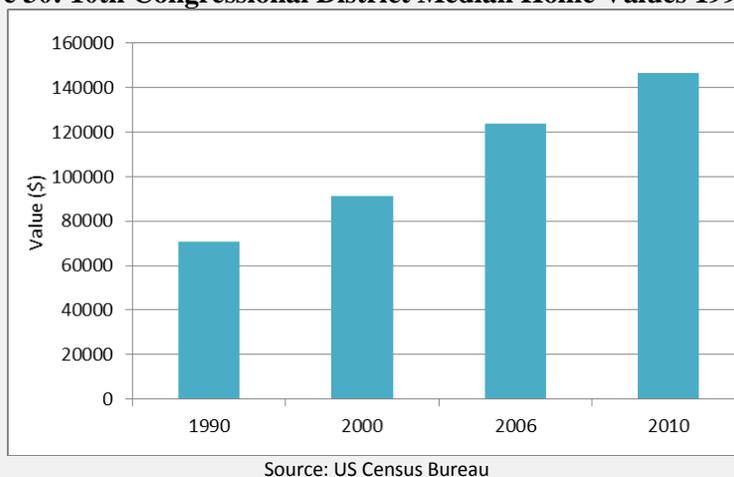
Figure 17: 10th Congressional District Median Income 1990-2010



Housing

Median housing prices jumped from \$70,600 to \$146,400 - a 100 percent increase over the 20-year period. Despite the country's economic recession, housing values increased 18 percent from 2006 to 2010. The Institute completed a housing study profiling many of the counties within the 10th Congressional District on behalf of the Appalachian Regional Commission. The study found that, due to a variety of circumstances, including the development of the Marcellus Shale, a housing shortage existed in the core counties, thus home values increased significantly. Housing values in the district's non-drilling counties remained level or decreased.

Figure 30: 10th Congressional District Median Home Values 1990-2010



Employment

Employment data for the 10th Congressional District are presented below. In 2006, before shale drilling and before the recession, the U.S. unemployment rate was 4.6 percent and by 2010, the U.S. rate was 9.6 percent. The 10th Congressional District, however was at 6.4 percent or approximately 2 percent higher in 2006 before the recession and before Marcellus drilling. However, by 2010 when the rest of

the nation had higher unemployment, the 10th Congressional District was at 8.8 percent – almost a full percentage point lower than the U.S. average.

Table 10: 10th Congressional District Employment

	2006	2010
Labor Force	322,807	330,229
Employed	302,190	329,887
Unemployed	20,617	28,990
Unemployment Rate	6.4%	8.8%

Source: US Bureau of Labor Statistics

Employment data is presented by showing data by county for several counties within the 10th Congressional District. The counties include two core drilling counties and two counties with no drilling. While Susquehanna and Bradford Counties showed some unemployment increases in 2010 due to general economic conditions, such increases were nowhere close to unemployment rates in Lackawanna and Luzerne Counties, the two non-drilling counties, where unemployment rates are much higher than both the drilling counties and the national average of 9.6 percent. By 2011, Bradford County’s unemployment rate was 5.9 percent and Susquehanna County’s was 7.6 percent, compared with 9.1 percent in Lackawanna County, 9.4 percent in Luzerne County and 9 percent nationwide.

Table 11: Susquehanna County Employment

	1990	2000	2006	2010
Labor Force	20,362	22,370	21,401	22,370
Employment	16,987	19,559	20,383	20,477
Unemployment	1,240	803	1,018	1,893
Unemployment Rate	6.80%	3.90%	4.80%	8.50%

Source: US Bureau of Labor Statistics

Table 12: Bradford County Employment

	1990	2000	2006	2010
Labor Force	28,149	30,243	30,749	33,249
Employment	26,555	29,144	29,312	31,015
Unemployment	1,594	1,099	1,437	2,234
Unemployment Rate	5.70%	3.60%	4.70%	6.70%

Source: US Bureau of Labor Statistics

Table 13: Lackawanna County Employment

	1990	2000	2006	2010
Labor Force	106,094	103,664	106,176	106,900
Employment	98,542	98,973	101,009	97,174
Unemployment	7,552	4,691	5,167	9,726
Unemployment Rate	7.1%	4.5%	4.9%	9.1%

Source: US Bureau of Labor Statistics

Table 14: Luzerne County Employment

	1990	2000	2006	2010
Labor Force	169,730	168,450	171,789	160,670
Employment	156,983	159,736	162,604	156,857
Unemployment	11,767	8,043	9,185	15,879
Unemployment Rate	7.50%	5.20%	5.30%	9.90%

Source: US Bureau of Labor Statistics

Conclusion

The purpose of this study is to analyze the potential impact of drilling of Marcellus Shale deposits on various demographic and economic indicators. The study also aims to supply a detailed comparison of other similar regions in the country that have first hand knowledge of such increases in population and wealth due to natural gas drilling in shale deposits.

By updating this study with the most recent information from 2011, the Institute can further assess the changes taking place throughout the counties and states that partake in shale deposit drilling. Furthermore, such information can be used as a model for a successful new industry in Pennsylvania, specifically in the 10th Congressional District. The challenge is that there are several core drilling counties in the 10th Congressional District, as well as other “adjacent” counties. When the indicators are presented by county, it is apparent that the core drilling counties are performing better than the non-core drilling counties.

In Case Study 1, the Institute found that since 2006, the Barnett Shale well production has increased steadily since 2006. In addition, Denton County, Texas, saw its population more than double since 1990. The county also experienced remarkable growth in both household income and occupied housing values. Denton, like northeast Pennsylvania has a strong higher education infrastructure and rural areas very similar to the 10th Congressional District.

In Case Study 2, we found that the population in Faulkner County, Arkansas, has increased 90 percent in the past 20 years due to natural gas exploration in the Fayetteville Shale. As is the case in the previous case study, Faulkner County also recorded a substantial increase in household and median income. Homeownership rates also increased by a remarkable 172 percent over the 20 examined. White County, Arkansas, showed similar growth, but on a much smaller scale. The county’s population increased 30 percent over the 20 years, while there were additional increases in income and housing values. The Arkansas Counties bear more resemblance to the 10th Congressional District. They are areas that have

suffered population loss, have many rural components and a few urban communities, albeit none like in Texas.

Data presented for the 10th Congressional District showed how a region suffering from population loss and job loss began to display economic growth and strength at time when other parts of the country were in a severe recession. However, more detailed analysis of employment data show an area divided by core drilling counties and non-drilling counties, which further magnifies drilling impacts. This is not to say, however, that the non-drilling counties cannot or will not see future benefit. Like Denton County, Texas, other parts of the 10th Congressional District have a strong higher education infrastructure and represent the region's more urban communities. Aside from assets like schools and airports, the surrounding counties can benefit by focusing economic development on the continued development of local businesses needed by the natural gas industry as a whole, and working to bring in new businesses that use natural gas in their processes. The ongoing pipeline development through northeast and central Pennsylvania provides the infrastructure to support this kind of strategy.

The Institute has found considerable possibilities for growth within Pennsylvania's 10th Congressional District, and some counties have already begun to see some of the effects of the Marcellus Shale drilling. Although this exploration is still in early development, the case study comparisons of different regions allow us to conclude that there is definite potential for growth in wealth, employment, and housing within the 10th Congressional District. There are many companies that are currently invested in the growth of the Marcellus Shale and its natural gas supply, but we can only see the effects as more energy companies come to the region. As this industry grows, we will begin to see the impact it has on NEPA's economy. Since the 10th Congressional District is comprised of adjacent counties in addition to the core counties, there must be considerable strategic economic development initiatives in place to ensure that there is direct economic benefit in addition to any spill over from the core drilling counties.

There is a clear advantage to natural gas drilling in the Marcellus Shale, but there will certainly be challenges in the process. The opportunity exists; now, it is a matter of time until we can truly analyze its importance and impact.