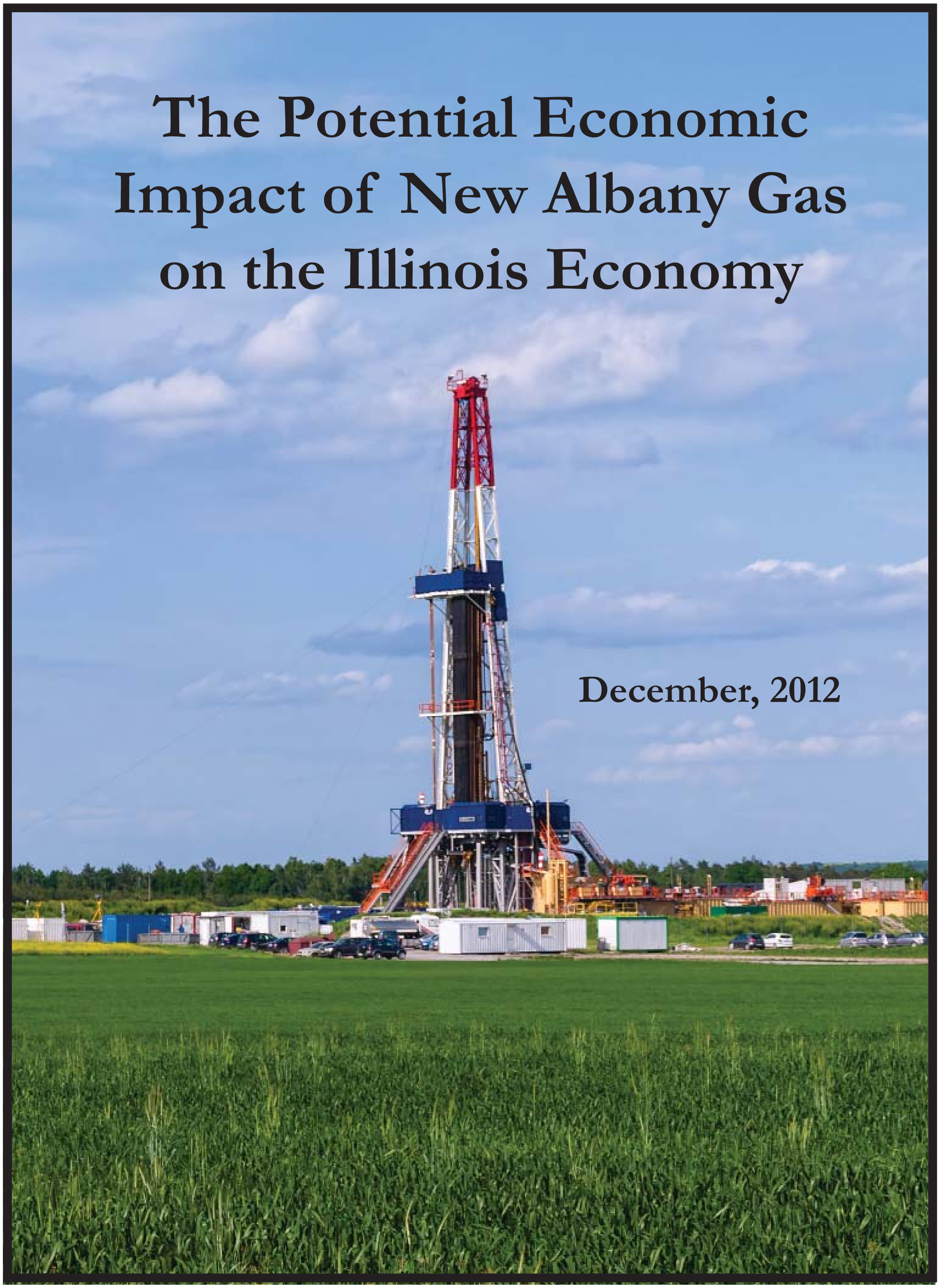
The Potential Economic Impact of New Albany Gas on the Illinois Economy



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About the Author

Dr. David G. Loomis is Professor of Economics at Illinois State University and Director of the Center for Renewable Energy. He has over 10 years experience in the wind industry and has performed economic analyses at the county, region, state and national levels for both wind farms and the wind turbine supply chain. He has served as a consultant for the State of Illinois, Illinois Finance Authority, Illinois State Energy Office, Invenergy, Clean Line Energy Partners, Illinois Chamber of Commerce and others. He has testified on the economic impacts of wind energy before the Illinois Senate Energy and Environment Committee and the LaSalle and Livingston County Boards in Illinois. Dr. Loomis is a widely recognized expert and has been quoted in the Wall Street Journal, Forbes Magazine, Associated Press, and Chicago Tribune as well as appearing on CNN.

Dr. Loomis has published over 15 peer-reviewed articles in leading energy policy and economics journals. He has raised and managed over $5 million in grant and contracts from government, corporate and foundation sources. He received the 2011 Department of Energy's Midwestern Regional Wind Advocacy Award and the 2006 Best Wind Working Group Award. He runs the Illinois Wind Working Group, serves on the Steering Committee of the Great Lakes Wind Collaborative (GLWC) and chairs the Economic Development Committee of the GLWC. Dr. Loomis received his Ph.D. in economics from Temple University in 1995.

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Executive Summary

This study examines the potential impacts that hydraulic fracturing of shale gas would have on Illinois economy in terms of direct, indirect, and induced jobs; earnings; and total economic activity. Illinois is home to the New Albany shale gas formation which covers a substantial portion of the southern part of Illinois. It is too early to exactly quantify the total potential of the New Albany play since exploratory drilling is just beginning to be initiated. However, some conservative estimates of the impact of drilling can be developed. There may also be oil in the New Albany shale formation, but it is too early to give a reasonable estimate of its size or economic impact.

The study examined three different scenarios of investment with three different levels of local content. Local content refers to the level of capital and labor that comes from sources within the State of Illinois. The low scenario assumes a low level of exploratory drilling takes place. The medium scenario assumes a more robust level of exploration takes place. The high scenario assumes that this higher level of exploration takes place for two years followed by three years of production. This scenario looks at the five-year annual investment of this mixture of exploration and production. These assumptions are very conservative compared to the investments already taking place in other states. They only account for the drilling investment in the state and specifically exclude the land leases and royalty payments to land owners because those payments are highly dependent on the resources that are found.

The total employment impacts (direct, indirect and induced impacts) for the three different scenarios are:

- 1,034 for the low scenario (assuming 10% local content)
- 10,337 for the medium scenario (assuming 50% local content)
- 47,312 for the high scenario (assuming 90% local content)

The high scenario is similar to the historical employment impacts of shale gas measured in Arkansas (9,683), Pennsylvania (44,098), Texas (Eagle Ford only – 47,097), and Louisiana (57,637).

Conclusion

The New Albany shale play is still unproven but has the potential to be a significant creator of jobs for the State of Illinois. Even with the modest ramp-up of jobs assumed in this study, a minimum of 1,000 jobs would be created or supported each year with the potential of 47,000 jobs annually if the highest scenario is realized. This highest scenario translates into over $9.5 billion of economic impact for the state.

I. Introduction

This study was performed by Loomis Consulting for the Illinois Chamber of Commerce Foundation which is interested in studying the potential impacts that hydraulic fracturing of shale gas would have on Illinois economy in terms of direct, indirect, and induced jobs; earnings; and total economic activity. Illinois is home to the New Albany shale gas formation which covers a substantial portion of the southern part of Illinois.

It is also important to note what the analysis of the impacts of shale gas drilling does not include, specifically,

- the effect of land leases and royalty payments;
- the *net effects* of the proposed project, i.e., the potential impacts on other forms of energy such as coal, oil or electricity;
- the economic costs of any pass-through rates, regulations or taxes that producers or customers could be required to pay;
- dynamic effects of how the jobs would ramp up over time;
- any environmental impacts, costs, or benefits;
- the potential impacts on natural gas prices or electricity prices;
- the potential impacts of regulations associated with shale gas.

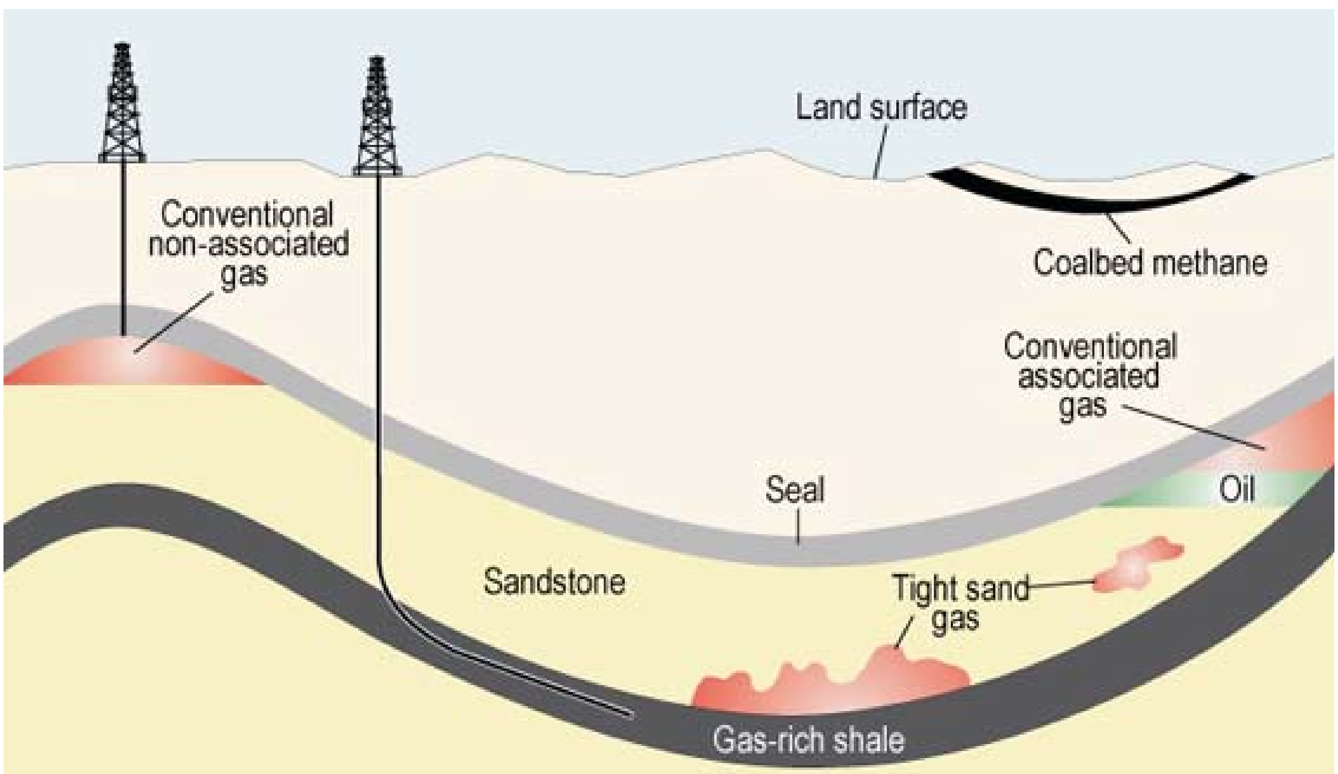
The rest of the report is organized as follows: Section II provides background information on shale gas formations and hydraulic fracturing. Section III reviews the major studies that have examined the economic impacts of other shale gas formations. Section IV provides the investment assumptions for Illinois-based drilling of the New Albany shale formation that are used in the modeling. The IMPLAN software and general study methodology are provided in Section V. The results of the analysis are explained in Section VI.

II. Background on Shale Gas

Shale gas refers to natural gas that is trapped within shale rock formations. Shale is sedimentary rock which is formed by the accumulation of sediments at the Earth's surface and within bodies of water. Geologists have known about shale gas for a long time but these resources were not economically feasible to extract using older techniques. Over the past decade, the widespread use of horizontal drilling and hydraulic fracturing has made it economically viable to extract natural gas from these shale formations.

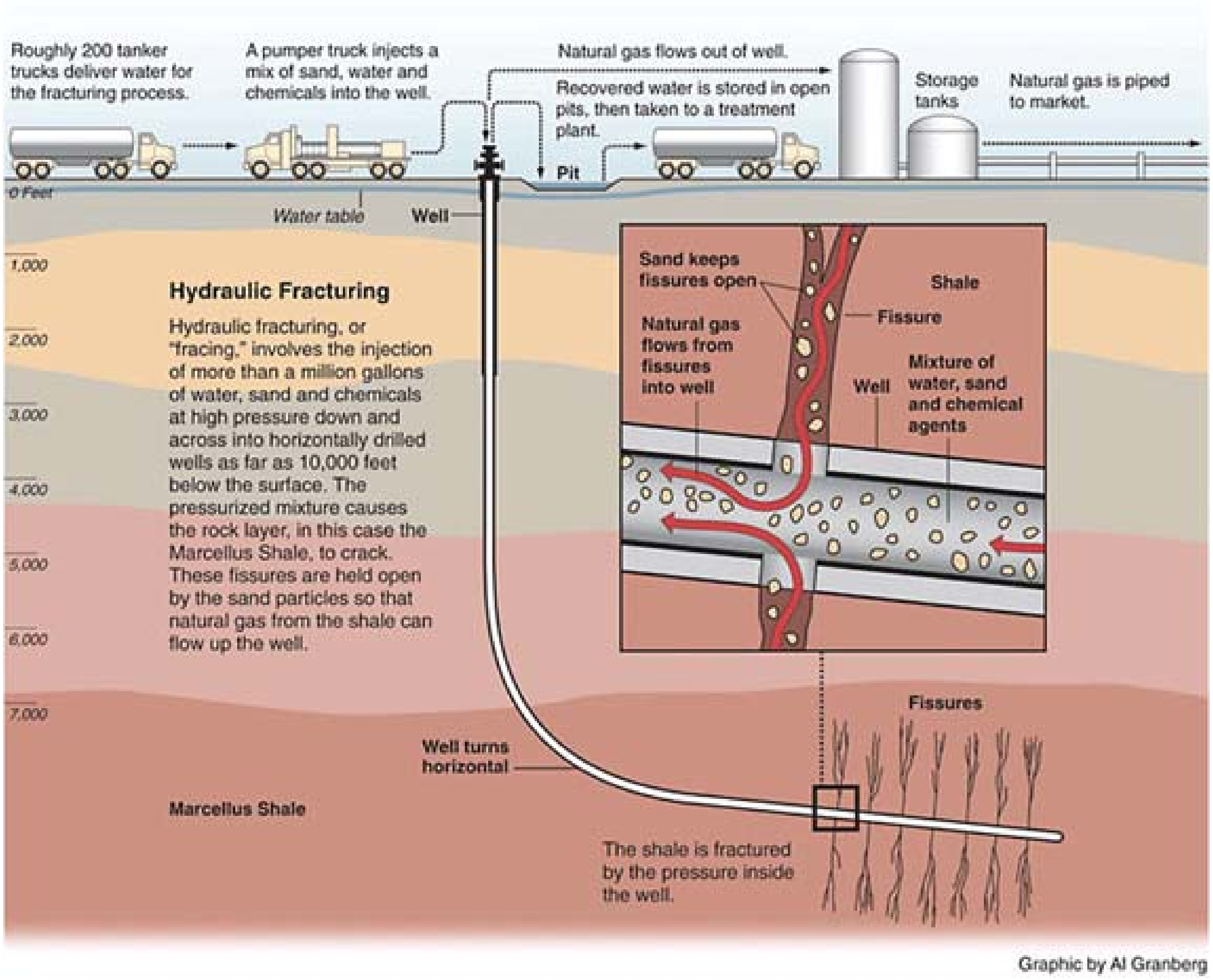
Figure 1 shows the difference between drilling for conventional gas and drilling for shale gas. When drilling for convention gas, there is only a vertical pipeline drilled down to the deposit of gas. In shale gas drilling, there is vertical drilling and pipe as well as horizontal drilling and pipe. In addition, hydraulic fracturing using a high pressure water, sand, and chemical mixture is used to break up the rock and release the trapped pockets of natural gas as shown in Figure 2.

Figure 1.— Shale Gas Formations and Drilling



Source: Energy Information Administration and U.S. Geological Survey (http://www.eia.gov/energy_in_brief/about_shale_gas.cfm)

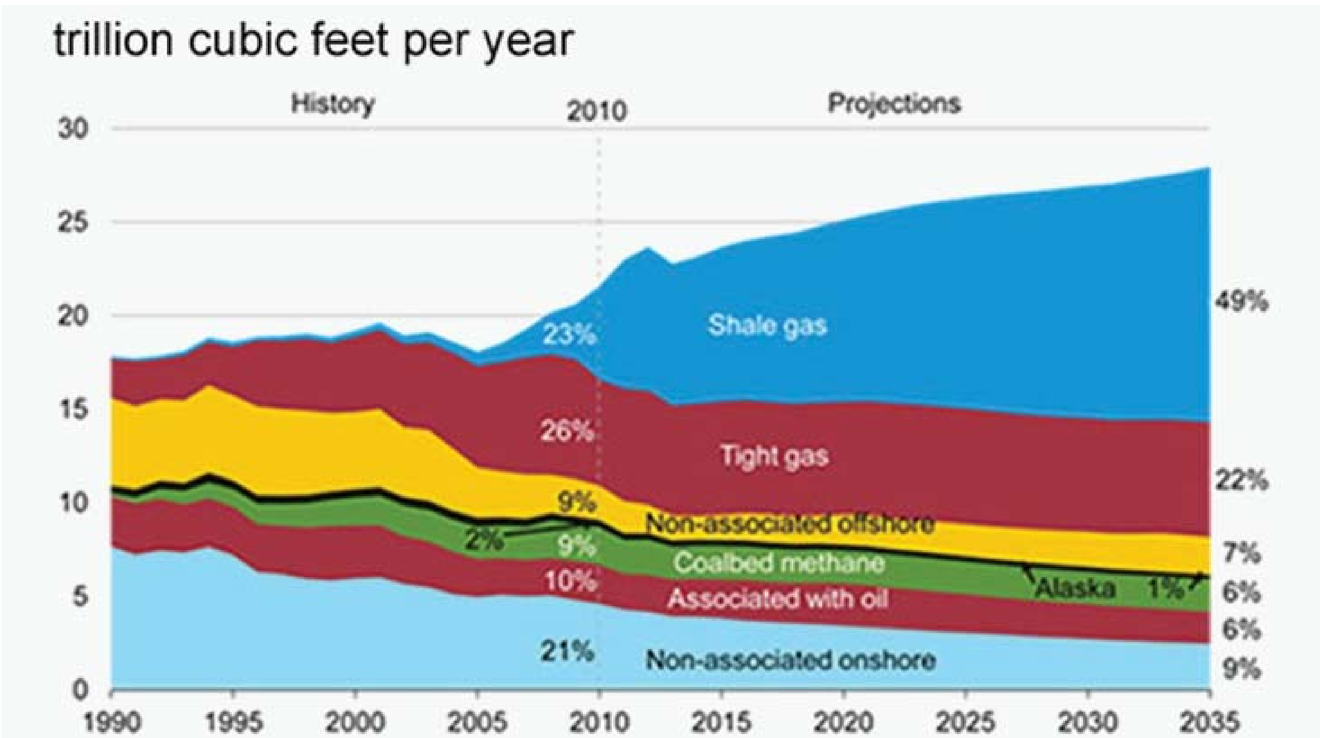
Figure 2.— Hydraulic Fracturing



Source: Energy Information Administration (http://www.eia.gov/energy_in_brief/about_shale_gas.cfm)

U.S. natural gas production has grown rapidly since 2006 and all of that increase is due to shale gas. Figure 3 shows that U.S. natural gas production since 1990. From 1990-2006, production was steady between 17-20 trillion cubic feet (tcf). Since 2006, production has increased to 22 tcf in 2010. In 2010, shale gas provided 23% of the total production. The EIA expects this amount to grow to 49% by 2035.

Figure 3.— U.S. Natural Gas Production 1990-2035



Source: U.S. E nergy Administration, *Annual Energy Outlook 2012* (June 2012).

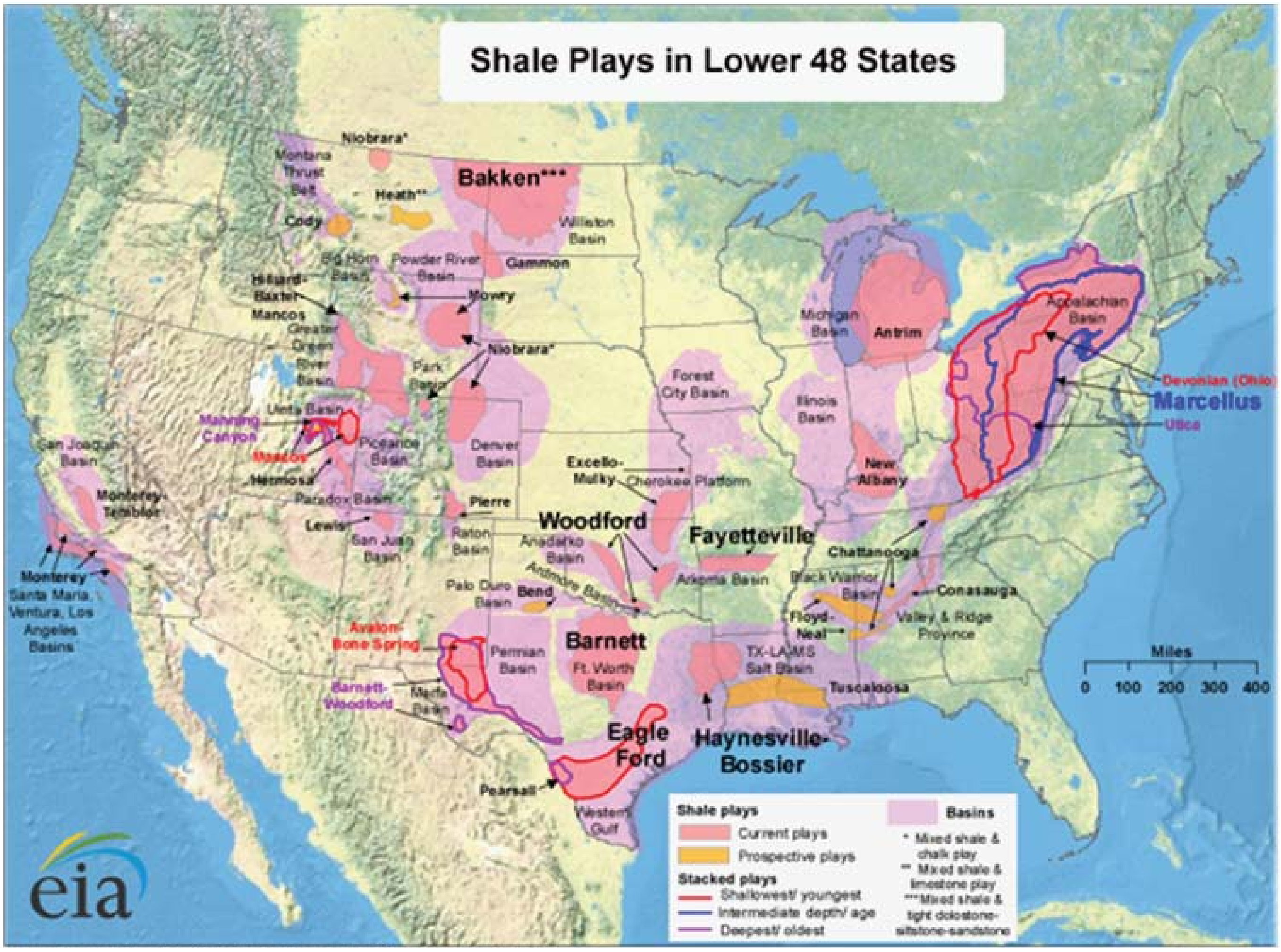
Shale plays are shale formations which contain significant accumulations of natural gas and which share similar geologic and geographic properties. Figure 4 shows a map of the largest shale plays in the lower 48 states. Table 1 shows a list of the different shale plays and their relative sizes. The New Albany shale play is in the middle of the ranking of shale plays within the Northeast Region.

Table 1.— U.S. Shale Plays and Estimated Resources

Region	**Shale Play**	**Shale Gas Resources (trillion cubic feet)**
Northeast	Marcellus	410
	Antrim	20
	Devonian Low Thermal Maturity	14
	New Albany	**11**
	Greater Siltstone	8
	Big Sandy	7
	Cincinnati Arch	1
Gulf Coast	Haynesville	75
	Eagle Ford	21
	Floyd-Neal & Conasauga	4
Mid-Continent	Fayetteville	32
	Woodford	22
	Cana Woodford	6
Southwest	Barnett	43
	Barnett-Woodford	32
	Avalon & Bone Springs	-
Rocky Mountain	Mancos	21
	Lewis	12
	Williston-Shallow Niobraran	7
	Hilliard-Baxter-Mancos	4
	Bakken	-
West Coast	Monterey/Santos	-

Source: U.S. EIA, 2011

Figure 4.— U.S. Shale Plays



Source: Energy Information Administration based on data from various published studies. Updated May 9, 2011.

The New Albany shale formation is contained in the Illinois basin which covers 60,000 square miles across Illinois, Indiana and Kentucky. Although Figure 4 only shows the New Albany formation in Indiana and Kentucky, it does extend into Illinois as part of the area shown as Illinois Basin. The New Albany shale lies at a depth that varies from 600 to 5,000 feet. The New Albany shale play was been discussed for quite some time. Two geologists from the Illinois State Geological Survey published an article about the natural gas potential in the New Albany shale back in 1985 (Cluff & Dickerson, 1982). According to the 1995 U.S. Geological Survey appraisal, New Albany shale gas represents 52% of the undiscovered oil and gas reserves of the Illinois basin, with another 45% attributed to coalbed methane (quoted in RCF, 2009, 47). The volumes of in-place and technically recoverable gas in New Albany shale have been estimated to be between 86 and 160 trillion cubic feet (tcf) and 1.9 to 19.2 (tcf) respectively (quoted in Perry & Salehi, 2009, 1). There may also be oil in the New Albany shale formation, but it is too early to give a reasonable estimate of its size or economic impact.

III. Summary of Other Shale Gas Economic Impact Studies

There have been several national studies of the economic impact of shale gas. The latest report by IHS was just released in October, 2012 (IHS, 2012). The total number of direct jobs coming from unconventional gas activity is 187,360 in 2012 and rises to 436,773 \by 2035 (IHS, 2012, 25). The total employment including direct, indirect and induced jobs is 902,675 and rises to 2,108,481 by 2035 (IHS, 2012, 25). An earlier study in 2009 by IHS Global Insight prepared for America's Natural Gas Alliance (ANGA) looked at the natural gas industry as a whole (conventional and unconventional gas) and found that Illinois has 7,832 direct workers in the natural gas industry in 2008 along with 37,958 indirect and induced workers for a total of 45,790 (IHS Global Insight, 2009, 14). A later IHS Global Insight Study found the total number of direct jobs due to shale gas nationally was 148,143 in 2010 rising to 360,335 in 2035 (IHS Global Insight, 2011, 1). The total employment including direct, indirect and induced jobs is 601,348 and rises to 1,660,090 by 2035 (IHS, 2012, 25). Clearly, the number of jobs forecasted by 2035 keeps increasing as the historical employment numbers increase beyond expectations.

Several other reports provide helpful background on the future of shale gas in the U.S. An MIT interdisciplinary study titled, The Future of Natural Gas, does not look at the economic impact but does examine the role of shale gas in the overall supply and demand mix of natural gas markets in the U.S. (MIT, 2011). An Energy Information Administration report examines the different U.S. shale gas and shale oil plays. That report estimates that the shale gas resources of the New Albany play as 11 trillion cubic feet (EIA, 2011, 5).

In addition to the national studies, there have been several state-level studies on the economic impact of shale gas. Considine, et.al (2010) looked at the impact of the Marcellus Shale on the Pennsylvania economy. The study found the total number of jobs (direct, indirect and induced) was 44,098 in 2009 and they projected this number to rise to 160,205 by 2015 and 211,909 by 2020 (Considine, et. al, 2012, iv). Considine also did an economic impact study of the Marcellus Shale on the states of New York, Pennsylvania and West Virginia (Considine, 2010). This study finds the same effect for Pennsylvania but shows the total jobs effect for West Virginia was 13,249 in 2009 (Considine, 2010, 24). The study showed that the potential total jobs impacts for state of New York would be 15,727 by 2015 (Considine, 2010, 29). Considine et. al. also survey other economic impact studies showing that Arkansas gained 9,683 jobs in 2008 from the Fayetteville shale play, Louisiana gained 57,637 jobs in 2009 from the Haynesville shale play; Texas gained 132,497 jobs in 2008 from the Barnett shale play and Pennsylvania and West Virginia gained 57,357 jobs in 2009 from the Marcellus shale play (Considine et. al., 2011, 6).

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Two recent studies have looked at the economic impact of newer shale plays. Kleinhenz et. al. (2011) examines the emerging Utica shale play. This study projects that 204,000 jobs will be created or supported by 2015 from the Utica shale (Kleinhenz, 2011, 3). A study by the University of Texas at San Antonio (2012) updates a previous study done in 2011. The study shows that 47,097 total jobs were created or supported in 2011 in the 20-county region in Texas and they project that 116,972 jobs will be created or supported in that area by 2021 (USTA, 2012, 5, 8).

In summary, the number of jobs coming from shale gas plays is large and is expected to get much larger in the coming years. Many early studies have updated their estimates which proved to be too low in the early years.

IV. Investment Assumptions

The New Albany shale formation has not been drilled as of the third quarter of 2012. Much more will be known about the potential for future drilling after the first test sites are completed and analyzed. However, we can make comparisons to investments in other shale formations and base reasonable modeling assumptions from their experience. To allow for the great degree of uncertainty, we will provide nine different model runs using three scenarios for drilling (high, medium, and low) and three scenarios for local content (high, medium, and low) for a single point in time.

Although these nine model runs are static in nature, they can be used to form a forecast (e.g. 2013 is low drilling; low local content; 2015 is medium drilling; medium local content and 2018 is high drilling; high local content) or a maximum potential for jobs and economic impact (high drilling with high local content).

Source: Nikolay Zaburdaev, www.123RF.com

The estimated cost per well of drilling for unconventional gas ranges from $3.5 million to $12 million (IHS/ANGA, 2012). The Utica Shale economic impact study assumed that the cost will be $10 million per well and the Marcellus Shale study assumed a cost of $7.7 million. Since the New Albany Shale averages 4,500 feet from the surface we would expect the cost of the vertical drilling part of the well to be somewhat lower. To be conservative, we assumed a cost of $7 million per well in exploration and $5 million per well in development.

Likewise, we assume a modest number of wells will be drilled. During exploration, industry experts expect that 400 wells per year could be drilled. During production, that number would rise to 2,000 wells per year. The Utica Shale study assumed over 4,000 wells will be drilled over the next five years so these estimates seem in the correct range and very reasonable.

To develop the low scenario, we use the exploration well cost of $7 million and half of the estimate of 400 wells per year or 200 wells to get $1.4 billion of annual investment. To develop the medium scenario, we use the exploration well cost of $7 million and the estimate of 400 wells per year to get $2.8 billion of annual investment. To develop the high scenario, we use a weighted average of two years of exploration of 400 wells per year at $7 million per well and 3 years of production at 2,000 wells per year with the production well cost of $5 million. This would result in an average of 1360 wells each year and $7.12 billion of average annual investment.

Table 2.— Investment Assumptions for the New Albany Shale Gas Play

	Low	**Medium**	**High**
Number of Wells (Annual)	200	400	1,360
Capital Expenditures ($ billions)	$1.4	$2.8	$7.12
Local (Illinois) Content	10	50	90

V. Study Methodology

Source: Jim Parkin, www.123RF.com

The economic impacts of the New Albany Shale Play were estimated using the IMPLAN 3.0 model and 2010 data for Illinois (2011 data will not be available until December, 2012). All impacts are reported at the state level for Illinois. Stated briefly, the model is used to estimate the total impacts of an increase in spending in a particular industry. IMPLAN is a PC-based program that allows construction of regional input-output models for areas ranging in size from a single zip code region to the entire United States. IMPLAN was originally developed for the US Department of Agriculture and is maintained and supported by the Minnesota IMPLAN Group, Inc., Stillwater, Minnesota. IMPLAN is a widely recognized and respected tool for economic impact analysis.

Total impacts are calculated as the sum of direct, indirect, and induced effects. Direct effects are production changes associated with the immediate effects of final demand changes, such as an increase in spending for drilling. Indirect effects are production changes in backward-linked industries caused by the changing input needs of the directly affected industry, e.g., additional purchases to produce additional output such as the pipe used in the drilling operations. Induced effects are the changes in regional household spending patterns caused by changes in household income generated from the direct and indirect effects. An example of the latter is the increased spending of the incomes earned by newly hired drilling workers. The analysis summarized here focuses on the impacts of increased production of the different components of the drilling operation. Employment includes total wage and salary employees as well as self-employed jobs in the State of Illinois. All of the employment figures reported here are full-time equivalents (FTE).[1] Employee compensation represents income, including benefits, paid to workers by employers, as well as income earned by sole proprietors. Total output represents sales (including additions to inventory), i.e., it is a measure of the value of output produced. Impacts are estimated on a statewide basis for Illinois.

[1]IMPLAN jobs include all full-time, part-time, and temporary positions. When employment is counted as full and part-time, one cannot tell from the data the number of hours worked or the proportion that is full or part-time. A full-time-employed (FTE) worker is assumed to work 2,080 hours (= 52 weeks x 40 hours/week) in a standard year. Employment impacts have been re-scaled to reflect the change in the number of FTEs.

VI. Results

Using the input and supply chain assumptions developed in the previous section, nine separate IMPLAN models were run. The low scenario assumed a total capital expenditure of $1.4 billion; the medium scenario - $2.8 billion and the high scenario - $7.12 billion. These expenditures were assumed to be in Sector 28 Drilling Oil and Gas Wells. This corresponds to NAICS code 213111. The exact expenditures entered are shown in Table 3.

Table 3.—Assumed Expenditures on Shale Gas in Illinois

Scenario	**Total Capital Expenditure (billions)**	**Local Content (Illinois)**	**Total Expenditure in Illinois (millions)**
Low	$1.40	10%	$140
		50%	$700
		90%	$1,260
Medium	$2.80	10%	$280
		50%	$1,400
		90%	$2,520
High	$7.12	10%	$712
		50%	$3,560
		90%	$6,408

The results for each model run will have detailed tables of the direct, indirect and induced jobs, earnings and total economic impact.

Source: Steve Rhode, www.123RF.com

Low Scenario

Tables 4-6 show the impacts under the low scenario which assumed only 200 exploration wells per year. According to Table 4, the number of new jobs created total over 1,000 under the 10% local content assumption to 9,300 under the 90% assumption. Besides the direct employment in drilling oil and gas wells, the sectors with the largest employment impacts are (in order of greatest employment impacts) Food Services, Private Hospitals, Real Estate Establishments, Wholesale Trade Businesses, Health Practitioners, and Architects and Engineers.

Table 4.— Employment Impacts

	Local Content		
Employment Impacts	**10%**	**50%**	**90%**
Direct	602.5	3,012.3	5,422.2
Indirect	111.1	555.4	999.7
Induced	320.1	1,600.5	2,881.0
Total	1,033.7	5,168.3	9,302.9

Table 5 shows the labor income impacts under the three local content assumptions. Labor Income includes both wages and benefits. The total labor income ranges from $53.8 million to $484.6 million.

Table 5.— Labor Income Impacts (million $)

	Local Content		
Labor Income Impacts	**10%**	**50%**	**90%**
Direct	$29.9	$149.6	$269.3
Indirect	$8.7	$43.4	$78.1
Induced	$15.2	$76.2	$137.2
Total	$53.8	$269.2	$484.6

Source: Dimitry Naumov, www.123RF.com

According to Table 6, total economic output will increase by $207.8 million under the 10% scenario, $1.04 billion under the 50% scenario and $1.87 billion under the 90% scenario.

Table 6.— Total Economic Impact (million $)

	Local Content		
Total Economic Impacts	**10%**	**50%**	**90%**
Direct	$140.0	$700.0	$1,260.0
Indirect	$24.2	$121.0	$217.8
Induced	$43.6	$217.8	$392.0
Total	$207.8	$1,038.8	$1,869.8

Medium Scenario

Tables 7-9 show the impacts under the medium scenario. The medium scenario assumes that 400 exploration wells will be drilled per year. According to Table 7, the number of new jobs created total over 2,000 under the 10% local content assumption to 18,600 under the 90% assumption. Besides the direct employment in drilling oil and gas wells, the sectors with the largest employment impacts are, again, Food Services, Private Hospitals, Real Estate Establishments, Wholesale Trade Businesses, Health Practitioners, and Architects and Engineers.

Table 7.— Employment Impacts

	Local Content		
Employment Impacts	**10%**	**50%**	**90%**
Direct	1,204.9	6,024.7	10,844.4
Indirect	222.2	1,110.8	1,999.4
Induced	640.2	3,201.1	5,762.0
Total	2,067.3	10,336.6	18,605.8

Table 8 shows the labor income impacts under the three local content assumptions. The total labor income ranges from $107.7 million under the 10% local content assumption to $969.2 million under the 90% assumption.

Table 8.— Labor Income Impacts (million $)

	Local Content		
Labor Income Impacts	**10%**	**50%**	**90%**
Direct	$59.8	$299.2	$538.6
Indirect	$17.4	$86.8	$156.3
Induced	$30.5	$152.4	$274.3
Total	$107.7	$538.4	$969.2

According to Table 9, total economic output will increase by $415.5 million under the 10% scenario, $2.08 billion under the 50% scenario and $3.74 billion under the 90% scenario.

Table 9.— Total Economic Impact (million $)

	Local Content		
Total Economic Impacts	**10%**	**50%**	**90%**
Direct	$280.0	$1,400.0	$2,520.0
Indirect	$48.4	$242.0	$435.6
Induced	$87.1	$435.6	$784.0
Total	$415.5	$2,077.6	$3,739.6

High Scenario

Tables 10-12 show the impacts under the high scenario. The high scenario assumes the total capital investment of $7.12 billion per year that includes a weighted average of 2 years of exploration followed by 3 years of production. According to Table 10, the number of new jobs created total 5,257 under the 10% local content assumption; 26,284 under the 50% local content assumption; and 47,312 under the 90% assumption. Besides the direct employment in drilling oil and gas wells, the sectors with the largest employment impacts are (in order of highest employment impacts) Food Services, Private Hospitals, Real Estate Establishments, Wholesale Trade Businesses, Health Practitioners, and Architects and Engineers.

Table 10.— Employment Impacts

Employment Impacts	Local Content 10%	50%	90%
Direct	3,064.0	15,319.8	27,575.7
Indirect	564.9	2,824.6	5,084.3
Induced	1,628.0	8,139.9	14,651.9
Total	5,256.9	26,284.4	47,311.9

Source: Jim Parkin, www.123RF.com

Table 11 shows the labor income impacts under the three local content assumptions. The total labor income ranges from $273.8 million under the 10% local content assumption to $2,464.5 million under the 90% assumption.

Table 11.— Labor Income Impacts (million $)

Labor Income Impacts	Local Content 10%	50%	90%
Direct	$152.2	$760.8	$1,369.5
Indirect	$44.2	$220.8	$397.4
Induced	$77.5	$387.5	$697.6
Total	$273.8	$1,369.2	$2,464.5

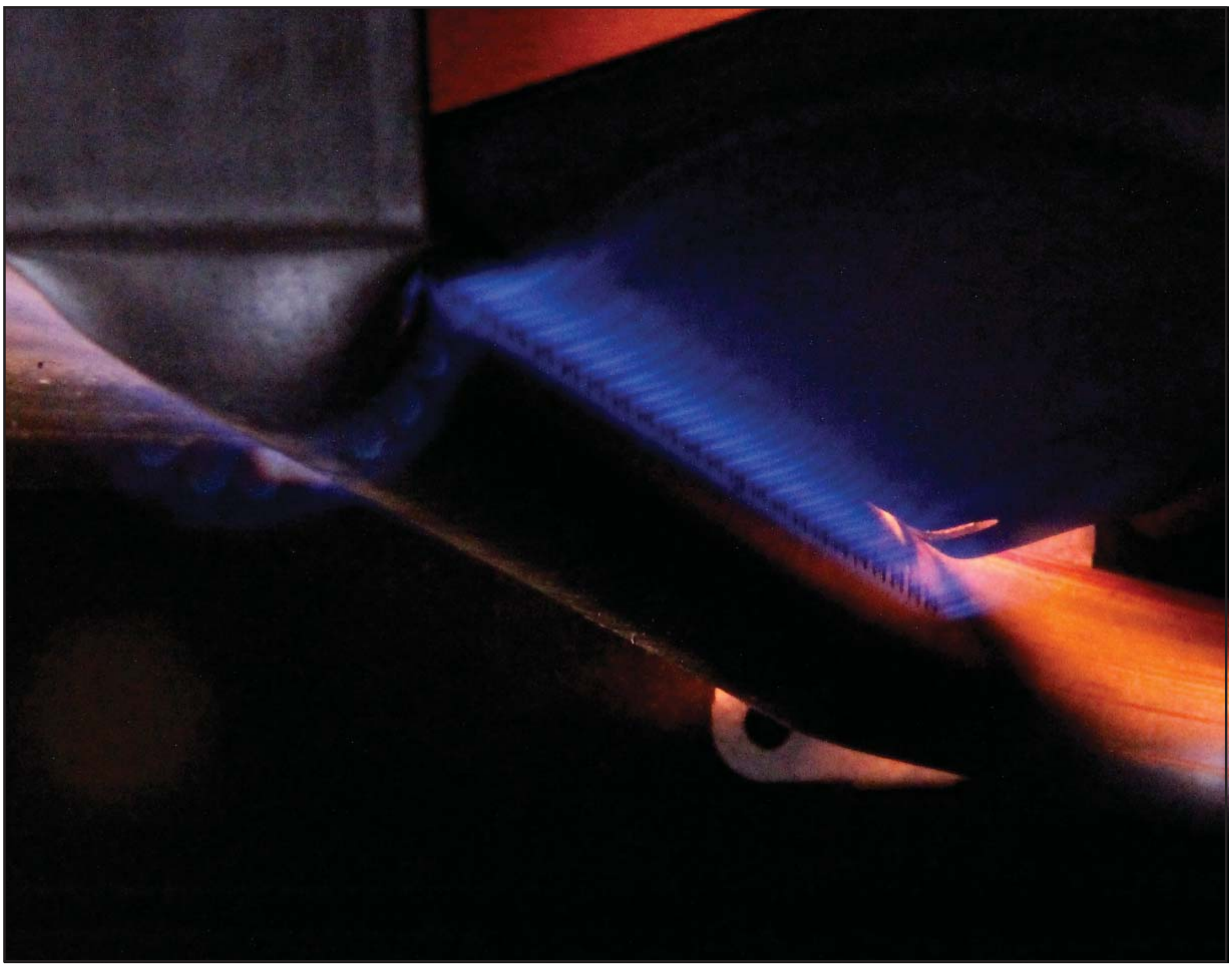
According to Table 12, total economic output will increase by $1.06 billion under the 10% scenario, $5.28 billion under the 50% scenario and $9.51 billion under the 90% scenario.

Table 12.— Total Economic Impact (million $)

Total Economic Impacts	Local Content 10%	50%	90%
Direct	$712.0	$3,560.0	$6,408.0
Indirect	$123.1	$615.3	$1,107.6
Induced	$221.5	$1,107.6	$1,993.7
Total	$1,056.6	$5,282.9	$9,509.3

Comparison to Other States

For comparison, Pennsylvania has added 44,000 jobs in 2009 from the Marcellus Shale (Considine, Watson and Blumsack, 2010). Texas added 47,000 jobs, paid $3.1 billion in salaries and benefits and had nearly $25 billion in total economic impact from the Eagle Ford Shale (Center for Community and Business Research, 2012). These are historical numbers and the projected jobs impacts range from 111,413 for Pennsylvania in 2011 to 116,972 for Texas in 2021. Another study of the Utica Shale play in Ohio projects 204,000 jobs created or supported by 2015 (Kleinhenz, and Smith, 2011).



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San Antonio Institute for Economic Development's Center for Community and Business Research, 2012. The Eagle Ford Shale: Economic Benefits for South Texas Communities. May 2012. San Antonio, TX.

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U.S. Energy Information Administration, 2011. Review of Emerging Resources: U.S. Shale Gas and Shale Oil Plays. July 2011. U.S. Department of Energy, Washington DC.

Weinstein, A., Partridge, M., 2011. The Economic Value of Shale Natural Gas in Ohio. December 2011. Department of Agricultural, Environmental and Development Economics, The Ohio State University.

Wood Mackenzie, 2011. U.S. Supply Forecast and Potential Jobs and Economic Impacts (2012-2030.) September 2011.

VIII. Curriculum Vita David Loomis

(Abbreviated)

David G. Loomis
Illinois State University
Department of Economics
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Education

Doctor of Philosophy, Economics, Temple University, Philadelphia, Pennsylvania, May 1995.

Bachelor of Arts, Mathematics and Honors Economics, Temple University, Magna Cum Laude, May 1985.

Experience

1996-present Illinois State University, Normal, IL
Full Professor – Department of Economics (2010-present)
Associate Professor - Department of Economics (2002-2009)
Assistant Professor - Department of Economics (1996-2002)

- Taught Regulatory Economics, Telecommunications Economics and Public Policy, Industrial Organization and Pricing, Individual and Social Choice, Economics of Energy and Public Policy and a Graduate Seminar Course in Electricity, Natural Gas and Telecommunications Issues.
- Supervised as many as 5 graduate students in research projects each semester.
- Served on numerous departmental committees.

1997-present Institute for Regulatory Policy Studies, Normal, IL
Executive Director (2005-present)
Co-Director (1997-2005)

- Grew contributing membership from 5 companies to 16 organizations.
- Doubled the number of workshop/training events annually.
- Supervised 2 Directors, Administrative Staff and internship program.
- Developed and implemented state-level workshops concerning regulatory issues related to the electric, natural gas, and telecommunications industries.

Experience (cont'd)

2006-present Illinois Wind Working Group, Normal, IL
Director
- Founded the organization and grew the organizing committee to over 200 key wind stakeholders
- Organized annual wind energy conference with over 400 attendees
- Organized strategic conferences to address critical wind energy issues
- Initiated monthly conference calls to stakeholders
- Devised organizational structure and bylaws
- Established and taught monthly Landowner Forums throughout the state.

2007-present Center for Renewable Energy, Normal, IL
Director
- Created founding document approved by the Illinois State University Board of Trustees and Illinois Board of Higher Education.
- Secured over $150,000 in funding from private companies.
- Hired and supervised 4 professional staff members and supervised 2 faculty members as Associate Directors.
- Reviewed renewable energy manufacturing grant applications for Illinois Department of Commerce and Economic Opportunity for a $30 million program.
- Created technical "Due Diligence" documents for the Illinois Finance Authority loan program for wind farm projects in Illinois.

1997-2002 International Communications Forecasting Conference
Chair
- Expanded Planning Committee with representatives from over 18 different international companies and delivered high quality conference attracting over 500 people over 4 years.

1985-1996 Bell Atlantic, Philadelphia, Pa.
Economist - Business Research
- Wrote and taught Applied Business Forecasting multimedia course.
- Developed and documented 25 econometric demand models that were used in regulatory filings.
- Provided statistical and analytic support to regulatory costing studies.
- Served as subject matter expert in switched and special access.
- Administered $4 million budget including $1.8 million consulting budget.

Professional Awards and Memberships

2011 Midwestern Regional Wind Advocacy Award from the Department of Energy's Wind Powering America presented at WindPower 2011

2009 Economics Department Scott M. Elliott Faculty Excellence Award, awarded to faculty who demonstrate excellence in teaching, research and service.

2008 Outstanding State Wind Working Group Award from the Department of Energy's Wind Power America presented at WindPower 2008.

2009 Illinois State University Million Dollar Club – awarded to faculty who have over $1 million in grants through the university.

1999 Illinois State University Teaching Initiative Award
Member of the American Economic Association, National Association of Business Economists, International Association for Energy Economics, Institute for Business Forecasters; Institute for International Forecasters, International Telecommunications Society.

Selected Publications

Chupp, B. A., Hickey, E.A. & **Loomis, D. G.** (2012). Optimal Wind Portfolios in Illinois. *Electricity Journal,* 25, 46-56.

Hickey, E., **Loomis, D. G.**, & Mohammadi, H. (2012). Forecasting hourly electricity prices using ARMAX-GARCH models: An Application to MISO hubs. *Energy Economics,* 34, 307-315.

Theron, S., Winter, J.R, **Loomis, D. G.**, & Spaulding, A. D. (2011). Attitudes Concerning Wind Energy in Central Illinois. *Journal of the America Society of Farm Managers and Rural Appraisers,* 74, 120-128.

Payne, J. E., **Loomis, D. G.** & Wilson, R. (forthcoming). Residential Natural Gas Demand in Illinois: Evidence from the ARDL Bounds Testing Approach. *Journal of Regional Analysis and Policy.*

Loomis, D. G. & Ohler, A. O. (2010). Are Renewable Portfolio Standards A Policy Cure-all? A Case Study of Illinois's Experience. *Environmental Law and Policy Review*, 35, 135-182.

Gil-Alana, L. A., **Loomis, D. G.**, & Payne, J. E. (2010). Does energy consumption by the U.S. electric power sector exhibit long memory behavior ? *Energy Policy*, 38, 7512-7518.

Professional Publications (cont'd)

Carlson, J. L., Payne, J. E., & **Loomis, D. G.** (2010). An assessment of the Economic Impact of the Wind Turbine Supply Chain in Illinois. *Electricity Journal,* 13, 75-93.

Apergis, N., Payne, J. E., & **Loomis, D. G.** (2010). Are shocks to natural gas consumption transitory or permanent? *Energy Policy*, 38, 4734-4736.

Apergis, N., Payne, J. E., & **Loomis, D. G.** (2010). Are fluctuations in coal consumption transitory or permanent? Evidence from a panel of U.S. states. *Applied Energy,* 87, 2424-2426.

Hickey, E. A., Carlson, J. L., & **Loomis, D. G.** (2010). Issues in the determination of the optimal portfolio of electricity supply options. *Energy Policy,* 38, 2198-2207.

Carlson, J. L., & **Loomis, D. G.** (2008). An assessment of the impact of deregulation on the relative price of electricity in Illinois. *Electricity Journal,* 21, 60-70.

Loomis, D. G., (2008). The telecommunications industry. In H. Bidgoli (Ed.), *The handbook of computer networks* (pp. 3-19). Hoboken, NJ: John Wiley & Sons.

Cox, J. E., Jr., & **Loomis, D. G.** (2007). A managerial approach to using error measures in the evaluation of forecasting methods. *International Journal of Business Research,* 7, 143-149.

Cox, J. E., Jr., & **Loomis, D. G.** (2006). Improving forecasting through textbooks – a 25 year review. *International Journal of Forecasting,* 22, 617-624.

Swann, C. M., & **Loomis, D. G.** (2005). Competition in local telecommunications – there's more than you think. Business *Economics,* 40, 18-28.

Swann, C. M., & **Loomis, D. G.** (2005). Intermodal competition in local telecommunications markets. *Information Economics and Policy,* 17, 97-113.

Swann, C. M., & **Loomis, D. G.** (2004) Telecommunications demand forecasting with intermodal competition – a multi-equation modeling approach. *Telektronikk,* 100, 180-184.

Cox, J. E., Jr., & **Loomis, D. G.** (2003). Principles for teaching economic forecasting. *International Review of Economics Education,* 1, 69-79.

Professional Publications (cont'd)

Taylor, L. D. & **Loomis, D. G.** (2002). Forecasting the internet: understanding the explosive growth of data communications. Boston: Kluwer Academic Publishers.

Wiedman, J. & **Loomis, D. G.** (2002). U.S. broadband pricing and alternatives for internet service providers. In D. G. Loomis & L. D. Taylor (Eds.) Boston: Kluwer Academic Publishers.

Cox, J. E., Jr. & **Loomis, D. G.** (2001). Diffusion of forecasting principles: an assessment of books relevant to forecasting. In J. S. Armstrong (Ed.), Principles of Forecasting: A Handbook for Researchers and Practitioners (pp. 663-650). Norwell, MA: Kluwer Academic Publishers.

Cox, J. E., Jr. & **Loomis, D. G.** (2000). A course in economic forecasting: rationale and content. *Journal of Economics Education,* 31, 349-357.

Malm, E. & **Loomis, D. G.** (1999). Active market share: measuring competitiveness in retail energy markets. Utilities Policy, 8, 213-221.

Loomis, D. G. (1999). Forecasting of new products and the impact of competition. In D. G. Loomis & L. D. Taylor (Eds.), *The future of the telecommunications industry: forecasting and demand analysis.* Boston: Kluwer Academic Publishers.

Loomis, D. G. (1997). Strategic substitutes and strategic complements with interdependent demands. The Review of Industrial Organization, 12, 781-791.

Grants

Total Grants: $2,481,661

The Potential Economic Impact of
New Albany Gas on the Illinois Economy