

Selected Comments on Sage Policy Group's report, "The Potential Economic & Fiscal Impacts of Natural Gas Production in Western Maryland," dated March 2012 (the Sage Report)

Comments prepared by Jannette M. Barth, Ph.D., Pepacton Institute LLC

January 16, 2013

The Sage Report was done on behalf of the Maryland Petroleum Council, an industry group, and it is very similar to other reports funded by the gas industry. The economic benefits are overstated and significant costs are not reflected in the estimates. Peer reviewed economic research reaches vastly different conclusions than the industry-funded studies. I have commented elsewhere on many of the flaws in various industry-funded studies that also pertain to the Sage Report. In this document, I point out a few of the most serious errors and omissions, and I refer the reader to some of my other writings on the subject that discuss some of the problems more extensively [1-10].

The amount of gas to be produced and the length of time that the industry will be present in a region are important assumptions to get right when estimating economic impacts to a region. Exhibit 1 on Page 9 is a chart from the U.S. Energy Information Administration (EIA) that shows total Marcellus shale gas resources at 410 trillion cubic feet. In a footnote, the Report states that the EIA's estimate of shale gas resources in the Marcellus was reduced to 141 trillion cubic feet. This large decline is hidden in a footnote, and the Report does not mention that the U.S. Geological Survey's estimate is even lower, at 84 trillion cubic feet. It is highly uncertain how much shale gas can be profitably extracted in Western Maryland.

On page 29, the Sage Report states that total well-life could amount to twenty years, yet other research (not mentioned by Sage) indicates that actual experience with shale gas wells shows that well life is much shorter than twenty years. Arthur Berman, a noted petroleum geologist stated, "the average commercial life for horizontal wells is about 7.5 years, although the mode is four years" [11].

The Sage Report is misleading on Page 5 where it cites figures from the Marcellus Shale Education & Training Center. The Sage Report states, "it requires approximately 420 individuals across 150 occupations to bring a single well on line." The Sage Report does not clarify that workers move from well to well, from well pad to well pad, and from state to state. The casual reader may assume from the statement in the Sage Report that 420 new full time jobs will be created per well in Western Maryland. This is far from accurate. Also on page 5, it is stated, "A significant portion of workers emerge from the local economy." The Report fails to make it clear that the gas companies hire many workers from out of state and house them in temporary housing, often in man camps. Such workers often leave their families in their home states and send the bulk of their wages back to their families

to be spent in their home states, improving the economy there, not in Western Maryland. There has been recent reporting on the influx of temporary workers in North Dakota and its impact on communities [12].

The Sage Report concludes, “Marcellus Shale development represents a way for both Allegany and Garrett counties to secure a key driver of business investment and future job creation.” There are important facts that were not addressed prior to making this conclusion. Extractive industries, including shale gas development, are known for their boom and bust cycles, so claiming future job creation is misleading. Of course, there will be some short-term jobs created, but they will disappear when the industry leaves. And as is typical of short-term boom industries, they come into an area and attract workers from existing small businesses, forcing the small businesses to close. The shale gas industry will create an industrial landscape in formerly rural and pristine Western Maryland. Existing industries that are vital to Western Maryland, such as tourism, agriculture, hunting, fishing and vacation-home construction, are likely to decline as these industries are not compatible with an industrial landscape or with a real or perceived threat of water, air and land contamination. In the long-term, the two counties may be worse off if shale gas development is permitted.

In several of my writings, I have discussed economic impacts on Texas counties in the Barnett Shale, where shale gas drilling has been going on for over a decade. [1,4] According to the Texas Railroad Commission, there are four core gas drilling counties in the Barnett Shale. They are Denton, Johnson, Tarrant and Wise Counties. There are many reasons for differences between county data and state data, and changes and trends in the data. A comprehensive analysis should be conducted prior to making any definitive conclusions, but it is interesting to compare the economic health of the people in the four core Barnett Shale counties to the economic health of the state as a whole. When one considers unemployment rates, growth of median household income, and the number of people in poverty, it appears that the Barnett Shale core counties are not doing better than the rest of the state. For the period from 2003 to 2010, Median Household income increased by 21.2% in the state of Texas, but in the four core counties, median household income only increased between 10% and 16%. And for the same period, the increase in the average unemployment rates for the four core counties (2 percentage points) was very similar and a little higher than the increase in the state unemployment rate (1.5 percentage points). Finally, the number of people in poverty in the four core shale counties increased, in percentage terms, just as much as statewide. When you consider the number of people in poverty, the unemployment rate and median household income growth, gas intensive counties in Texas don’t appear to be doing well compared to the state as a whole.

(Sources of Data: U.S. Census Bureau, Small Area Estimates Branch; and Bureau of Labor Statistics)

A recent report from West Virginia shows that the expected “game changing” gas boom has not materialized there. In four years of shale gas drilling, only 916 jobs

were created in West Virginia. “And the severance tax that was expected to produce tens of millions of dollars in new revenue has not grown at all.” The unemployment rate in the four core drilling counties has risen from 4.4% to 6.9% since drilling began and their workforces have declined in size. [13]

The conclusions in the Sage Report are far too optimistic as benefits are exaggerated and significant costs are not taken into account. Bias toward the gas industry is evidenced on Page 9 in its description of hydraulic fracturing. The Report states, “Hydraulic fracturing involves sealing off a section of a well and then injecting fluids at high pressure into that section of the well. The high pressure breaks (or fractures) rock, and sand is inserted to keep these fissures open allowing natural gas to move freely.” There is no mention of the chemicals used in the “fluids” and there is no mention of the concerns regarding the potentially hazardous material in the wastewater. There are enormous potential health costs to the region if carcinogenic and endocrine disruptive chemicals contaminate the water or land. And the wastewater, containing radioactive material, has to be removed and disposed, risking great environmental costs to the region. These potential costs are not mentioned in the Sage Report.

Costs to communities are not considered in the industry-funded studies, and the Sage Report is no exception. There will be costs to communities in the form of increased demand for social services, first responders, and police. Jill Morrison of the Powder River Basin Resource Council in Wyoming stated that there has been a 10% to 15% increase in crime and communities have had to build larger jails [14]. Fuller, in *The New Yorker* [15] has described increased crime and drug use in Wyoming communities with gas drilling.

Damage to roads is known to be significant. The Texas Department of Transportation reported that a conservative estimate of the repair costs for roads damaged by gas drilling activities is \$1 billion for farm-to-market roads and another \$1 billion for local roads [16].

The impact on property values is a great concern, but has been omitted from the Sage Report. In some cases, property values may increase, but in many cases they will decrease. In Texas, the Wise County Real Estate Appraisal Board decreased the value of homes by as much as 75% if a gas well sits on the property. And research by Duke University and Resources for the Future demonstrated that the risk of ground water contamination from natural gas extraction leads to a “large and significant reduction in house prices” and that “these reductions offset any gains to the owners of groundwater-dependent properties from lease payments or improved local economic conditions and may even lead to a net drop in prices...to the extent that the net effect of drilling on groundwater-dependent houses might even be negative, we could see an increase in the likelihood of foreclosure in areas experiencing rapid growth of hydraulic fracturing.”[17] A statement by Nationwide Insurance, “from an underwriting standpoint, we do not have a comfort level with the unique risks associated with the fracking process to provide coverage at a

reasonable price,” indicates that homeowners insurance may be difficult or impossible to purchase for property with a gas well. Negative impacts on property values must be considered in a valid economic assessment of shale gas development in Western Maryland.

On Page 34, it is stated that IMPLAN multipliers are used for the analysis. I have written elsewhere why the methodology underlying IMPLAN, input-output analysis, probably overstates benefits when it is used to analyze shale gas development [3].

The findings in the Sage Report are inconsistent with the conclusions of peer-reviewed research and other independent economic research that is not funded by the gas industry. For example, Kelsey and Ward [18] surveyed municipalities in Pennsylvania’s Marcellus region and concluded that “Most local governments being affected by shale gas development are not seeing more tax revenue as a result, while 26% of the local governments indicated that related costs had increased.” And recently published research shows that revenue is unlikely to offset burdens to state and local governments. Dutzik, Ridlington and Rumpler [19] have listed many of the economic costs and show that communities and states will bear many of the costs. Headwaters Economics [20] concluded that “counties that were not focused on fossil fuel extraction as an economic development strategy experienced higher growth rates, more diverse economies, better educated populations, a smaller gap between high and low income households and more retirement and investment income.” Freudenberg and Wilson [21] studied non-metropolitan regions and concluded, “the areas of the United States having the highest levels of long-term poverty tend to be found in the very places that were once the site of thriving extractive industries.” Recent research by Peach and Starbuck [22] found only **small** positive impacts on income, employment and population as a result of oil and gas extraction in New Mexico. And Weber [23] focused on the short-term impact of a natural gas boom in Colorado, Texas and Wyoming and found only **modest** increases in employment, wage and salary income, and median household income. Modest increases in employment, income and tax revenue are not likely to cover the large costs to state and local governments.

While less directly related to economic impacts, it should be noted that relevant peer-reviewed research has not been mentioned in the section on Page 14 where greenhouse gas emissions are discussed. Likewise, there is no mention of the very serious concern of high levels of radon in Marcellus gas and its potential impact on the end user. On Page 15, the Report claims that the low price of natural gas makes the commodity more attractive to end users, but there is no discussion of the impact that exports may have on the price of gas for Maryland consumers. Research by the EIA indicates that the price of gas will increase if significant exports are permitted. And, also on Page 15, the Report claims that pipeline construction will be a benefit to Western Maryland. The economic benefits of pipeline construction are very short-term, creating a few jobs for a short period of time. What is ignored here is the fact that once a network of pipelines is built, including gathering lines, transmission lines and larger pipelines, future development is unlikely as one

cannot build on top of or close to natural gas pipelines. All of these omissions are further confirmation that the Report does not represent a comprehensive analysis of the economic impact of shale gas development in Maryland.

It is shocking that peer-reviewed research is not mentioned, while work by Timothy Considine is repeatedly referenced and assumed to be accurate. It is stated on Page 24 that Sage actually used Considine's projections. Professor Considine's work is funded by the gas industry and has received extensive criticism [24-27]. Another study that is referenced on pages 10 and 20 in the Sage Report was conducted by IHS Global Insight and funded by America's Natural Gas Alliance. I have critiqued this study elsewhere [6].

Shale gas development in Western Maryland will benefit the gas industry and a few large landowners, but it is likely to be at the expense of small communities and statewide taxpayers. The long-term net economic impact may be negative for the region. Marylanders should insist on a comprehensive, unbiased economic assessment prior to any decisions being made regarding shale gas development.

References:

[1] Barth, JM, "Unanswered Questions About The Economic Impact of Gas Drilling in the Marcellus Shale: Don't Jump to Conclusions," March 27, 2010.

[2] Barth, JM, "North American Shale Gas Plays: More Unanswered Questions," January 17, 2011.

[3] Barth, JM, "The Truth About Those Industry Funded Studies," March 4, 2011.

[4] Barth, JM, "The Economic Impact of Shale Gas Development: Can New York Learn from Texas?" May 5, 2012.

[5] Barth, JM, "Critique of PPI Study on Shale Gas Job Creation," January 2, 2012.

[6] Barth, JM, "Comments on HIS Global Insight's Study, 'The Economic and Employment Contributions of Shale Gas in the United States' December 2011," January 27, 2012.

[7] Barth, JM, "Unanswered Questions About the Economic Impact of Shale Gas Exports: Don't Jump to Conclusions," Comments on 2012 LNG Export Study, December 11, 2012.

[8] Barth, JM, "Comments on the Revised Draft Supplemental Generic Environmental Impact Statement on the Oil, Gas and Solution Mining Program: Well Permit Issuance for Horizontal Drilling and High Volume Hydraulic Fracturing to Develop the Marcellus Shale and Other Low Permeability Gas Resources (SGEIS)," January 9,

2012.

[9] Barth, JM, "Comments on NYS DEC's Draft HVHF Regulations," December 28, 2012.

[10] Letter to New York State Governor Andrew Cuomo from Concerned Economists, December 14, 2012.

[11] Berman, A. "Lessons from the Barnett Shale suggest caution in other shale plays," ASPO-USA: Association for the Study of Peak Oil and Gas, August 10, 2009. <http://aspousa.org/2009/08/lessons-from-the-barnett-shale-suggest-caution-in-other-shale-plays/>

[12] Eligon, J., "An Oil Town Where Men Are Many, and Women Are Hounded," The New York Times, January 15, 2013.

<http://www.nytimes.com/2013/01/16/us/16women.html? r=0>

[13] O'Leary, S., "The Emperor has No Natural Gas Boom," Thursday, December 13, 2012, <http://www.the-state-of-my-state.com/2012/12/the-emperor-has-no-natural-gas-boom-pub.html>

[14] Morrison, J., Powder River Basin Resource Council, presentation at 2010 People's Oil & Gas Summit, Pittsburgh, PA. http://pennsylvania.sierraclub.org/moshannon/shalegas/PDFs/Panel2_JillMorrison_PowderRiverBasinResourceCouncil.pdf

[15] Fuller, A., "Letter from Wyoming, 'Boomtown Blues,'" The New Yorker, February 5, 2007, p. 38.

http://www.newyorker.com/reporting/2007/02/05/070205fa_fact_fuller

[16] Schlachter, B., "Drilling Trucks have Caused an Estimated \$2 billion in Damage to Texas Roads," *Star-Telegram*, July 2, 2012. <http://www.star-telegram.com/2012/07/02/4075195/drilling-trucks-have-caused-an.html#storylink=cpy> (accessed July 2, 2012).

[17] L. Muehlenbachs, E. Spiller and C. Timmins, "Shale Gas Development and Property Values: Differences Across Drinking Water Sources," Discussion Paper, Resources for the Future, July 2012.

[18] T.W. Kelsey and M. W. Ward, "Natural Gas Drilling Effects on Municipal Governments Throughout Pennsylvania's Marcellus Shale Region, 2010," Penn State Cooperative Extension.

[19] T. Dutzik, E. Ridlington, J. Rumpler, "The Costs of Fracking: The Price Tag of Dirty Drilling's Environmental Damage," Penn Environment Research & Policy Center, Fall 2012.

[20] Headwaters Economics, "Fossil Fuel Extraction as a County Economic Development Strategy: Are Energy-focusing Counties Benefiting?" *Energy and the West Series*, Bozeman, MT (Sept 2008 –revised 7/11/09)
<http://www.headwaterseconomics.org/energy> .

[21] Freudenberg, W.R. and Wilson, L.J., "Mining the Data: Analyzing the Economic Implications of Mining for Nonmetropolitan Regions," *Sociological Inquiry* 72(4) (2002): 549-575.

[22] Peach, J. and Starbuck, C.M., "Oil and Gas Production and Economic Growth in New Mexico," *Journal of Economic Issues* 45 (2) (2011):511-526.

[23] J.G. Weber, "The Effects of a Natural Gas Boom on Employment and Income in Colorado, Texas and Wyoming," *Energy Economics* 34(2012) 1580---1588.

[24] Efstathiou, Jim, "Penn State Faculty Snub of Fracking Study Ends Research," Business Week, October 3, 2012. <http://www.businessweek.com/news/2012-10-03/penn-state-faculty-snub-of-fracking-study-ends-research>

[25]Efstathiou, Jim, "Frackers Fund University Research That Proves Their Case," Bloomberg News, July 23, 2012. <http://www.bloomberg.com/news/2012-07-23/frackers-fund-university-research-that-proves-their-case.html>

[26] Rey, J., "UB Shutting Down Controversial Shale Institute," The Buffalo News, November 20, 2012.
<http://www.buffalonews.com/apps/pbcs.dll/article?AID=/20121119/CITYANDREGION/121119113/1010>

[27] Dinatale, Sara, "Campus Responds to Disputed Fracking Claims," The Spectrum, Published August 29, 2012, Updated November 5, 2012.
<http://www.ubspectrum.com/news/campus-responds-to-disputed-fracking-claims-1.2888498?pagereq=1#.UPieeKUrfdm>