Lessons from the Frontlines of Coal and Shale

December 9, 2015

Scott Miller
Director, Consortium for Energy, Economics and the Environment (CE3)
Ohio University’s Voinovich School of Leadership and Public Affairs

Email: Millers1@ohio.edu
Twitter: @ScottMillers1 and @OhioCE3
www.facebook.com/ohiouCE3
Phone: 740.593.0827
Ohio’s resource extractive economy

• SE Ohio’s economy has traditionally been driven by resource extraction
  – Logging
  – Oil and Gas
  – Clay
  – Salt
  – Iron
  – Coal
Energy in the Industrial Revolution
Mine on fire (background), 1890’s
Legacy of coal extraction

- Acid mine drainage
- Subsidence
- Mine fires
- Erosion
- Non-fishable streams
- Lack of capital investment
- Socioeconomic stagnation
A New North American Energy Boom
Many shale plays in the US
Overall US oil and gas economics

• Domestic natural gas production is up
• Domestic natural gas liquids production is up
• Domestic oil production is up

• Natural gas prices are low
• Natural gas liquids prices are low
• Oil prices are high Low
U.S. is now the world’s leading producer of petroleum and natural gas – three years running

* http://www.eia.gov/todayinenergy/detail.cfm?id=20692
Current statistics – December 3, 2015

- 1087 horizontal oil and gas wells in Ohio
- Nationwide 737 active rigs (down 1183 rigs [62%] from Dec, 14)
- In Ohio 19 active rigs in Ohio (down 28 rigs [61%] from Dec, 14)
- According to ODNR Ohio’s horizontal shale wells have produced more oil and gas in the first nine months of this year than they produced in all of 2014.
- Oil production increased 111% and gas production increased 126% in the first nine months compared with the first three quarters of 2014.*

<table>
<thead>
<tr>
<th></th>
<th>2014 (SHALE)</th>
<th>2015 (SHALE)</th>
<th>INCREASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barrels of oil</td>
<td>7,438,375</td>
<td>15,707,339</td>
<td>111%</td>
</tr>
<tr>
<td>Mcf of gas</td>
<td>287,846,105</td>
<td>651,193,106</td>
<td>126%</td>
</tr>
</tbody>
</table>

Midstream buildout is occurring

- More than $14 billion in capital improvement projects announced this year*
- More than eight major pipelines and several processing facilities being built
- The market appears to be out of state and offshore
- Regional capacity to store, transmit, fractionate, process and distribute products is not adequate to retain the product in this region
- Little value-add occurring inside Ohio - almost all the value being captured elsewhere
- Understanding regional supply chains and gaps will assist policy makers, investors, and entrepreneurs in creating greater local demand pull for these raw materials thereby reducing the propensity to ship them out of state or offshore
- Recent tri-state agreement outlines the desire by the leadership of all three states (OH, WV, PA) to coordinate on a regional basis around infrastructure and capital investment, workforce training, and marketing and outreach activities*


“Boomtown Impact” on local communities and governments

- Lack of information
- Volatility in growth
- Lack of jurisdiction
- Conflict between long-term and new residents
- Resistance to new government policies or planning
- Shortage of staff or expertise
- Lack or lag of sufficient revenue
- Economic impacts will not be evenly distributed among community
- Existing workforce training may not synch with industry needs
- Job growth may be stratified – not everyone interested or qualified
- Unrealistic expectations for economic prosperity
- Potential for crime, mental health problems, community dissatisfaction, and education shortfalls.

Jacquet, J, Energy Boomtowns and Natural Gas: Implications for Marcellus Shale Local Governments and Rural Communities. NERCRD Rural Development Paper No.43, January, 2009, 63 pp
Other local impacts - shale

• How Can Local Governments Benefit?
  • Donations/sponsorship to community center/building project
  • Huge and immediate wealth creation potential.
  • What about wealth retention?

• Environmental Impacts
  • Large Water Requirement. Where will it come from? Where and how will it be cleaned/disposed/released/reused?
  • Air Quality Issues
  • Possibility for soil contamination

• Emergency Response/ Preparedness
  • Are first-responders prepared & trained in oil/gas well response?
  • Training course needed & supplied by industry?

• Site Reclamation BMP’s

• Increased Road Traffic
  • Roadway Damage and Repair, increase in truck traffic, increased accidents

• Housing
  • Low income housing will/may become scarce
Externalized costs

• Heavy demand on local infrastructure can shorten life or require substantial new capacity
• Payments on conventional infrastructure financing often continue after extraction revenues decline
• Taxes and fees on extraction activities are seldom structured to address long-term costs
• Investment decisions generally target impacts of core industry and overlook secondary industries
• Environmental impacts may take decades to fully emerge or mitigate
Ohio University coal and shale research

• Advanced fuels research
• Advanced materials development
• Business assistance and supply chain management
• Policy development and analysis
• Community surveys
• Data management, mapping and spatial analysis
• Environmental monitoring and mitigation
• Check us out at www.ohio.edu/ce3
Lessons from the Frontlines of Coal and Shale

Scott Miller
Director, Consortium for Energy, Economics and the Environment (CE3)
Ohio University’s Voinovich School of Leadership and Public Affairs

Email: Millers1@ohio.edu
Twitter: @ScottMillers1 and @OhioCE3
www.facebook.com/ohiouCE3
Phone: 740.593.0827