Regional & Local Community Economic Impacts of Natural Gas Development

Timothy W. Kelsey, Ph.D
Penn State Cooperative Extension
A Few Background Concepts

• Scale of this may be **BIG**

• Resource-based economic development; when it’s gone, it’s gone

• Local impact- multiplier effects if keep dollars local

• Impacts will be unequal
Percent Change in Population, 2000-2007

Source: Alter et al., Pennsylvania Road to Growth, Penn State 2009
Percent Change in Population, 2000-2007

Location of Marcellus

Fast Growth: 7.2% and over
Slow Growth: 3.6 to 7.1%
Very Slow Decline: -0.1 to -3.5%
Slow Decline: -3.6 to -7.1%
Very Slow Growth: 0.0 to 3.5%
Fast Decline: -7.2% and over

Source: Alter et al., Pennsylvania Road to Growth, "Penn Staet 2009"
Phases of Natural Gas Development

Opportunities and Challenges
Three Phases of Natural Gas Development

**Development Phase** (Short Lived/Labor Intensive)
- Well-pad and Access Road Construction
- Local collection pipeline Construction
- Drilling of the Well
- Fracturing of the Well
- Reclaiming some Disturbance

**Production Phase** (Long lived/Small & Steady Labor Force)
- Trucking Water and condensate from Well Site
- Monitoring Production
- Occasional Well Work-Overs (partially re-drill/re-frac)

**Reclamation Phase**
- Dismantle and Reclaim well-sites

Source: Jacquet
Jonah/Anticline Fields Direct Workforce Through The Three Phases

Graph: Ecosystem Research Group/Jacquet
Annual Total Royalties in a Community

Annual Royalties

Wells drilled a year starts to decline

Wells drilled that year

Drilling ends in the community

Production curve based upon Cabot Oil & Gas data
Barnett - Which Industries Benefit?
Share of Annual Impact on Business Activity, 2008

<table>
<thead>
<tr>
<th>Business Sector</th>
<th>Personal income</th>
<th>Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude Petroleum &amp; Natural Gas</td>
<td>20%</td>
<td>6%</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>17%</td>
<td>28%</td>
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<tr>
<td>New Construction</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Maintenance &amp; repair</td>
<td>7%</td>
<td>6%</td>
</tr>
<tr>
<td>Business services</td>
<td>6%</td>
<td>4%</td>
</tr>
<tr>
<td>Health services</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>Eating &amp; drinking places</td>
<td>5%</td>
<td>15%</td>
</tr>
<tr>
<td>Transportation</td>
<td>4%</td>
<td>3%</td>
</tr>
</tbody>
</table>

Source: Perryman Group
Past Experience during Energy Booms

• An extensive research literature on energy boomtowns exists

• Direct & significant influence on population, affecting nearly all sectors of the community – Housing, Culture, Public Services

• Local governments are often unprepared by waves of growth

• Increases in social problems such as crime, mental health problems, community dissatisfaction, conflict

Source: NERCRD Paper No. 43
Experience *After* Energy Booms

• Many post-energy boom communities are no better off as a result of the experience
  ▫ Poorer economic and social well-being (poverty, unemployment, etc.) than other communities
  ▫ Lack of trust, leadership and human capital to find a way out

• Those which are better off after a boom tend to:
  ▫ Have strong local leadership & community involvement
  ▫ Entrepreneurial support systems to allow adaptation
  ▫ Actively monitor and respond to issues
Economic and Workforce Issues

Opportunities and Challenges
Potential Economic Impact

- Estimated $1.2 trillion +/- in recoverable natural gas in Pennsylvania - *NOT uniformly distributed across the Commonwealth*

- Total Earnings across ALL Industries (2007)
  - Pennsylvania - $355 billion
  - *PA counties with Marcellus* - $161 billion
Economic & Workforce Questions

Businesses
- Existing local businesses benefit?
- ‘New’ local businesses?
- Attract outside businesses?

Workers & Residents
- Local residents HAVE the skills?
- Locals LEARN the skills?
- Youth LEARN the skills & stay?
- Newcomers to move into county?
C. Can be a Two-Edged Sword

Experience in other states suggests major impacts on existing businesses & employees

- Very high wages in the industry
- Raises wages in other sectors
- Strong opportunities for existing businesses

Can be very high cost of living:

- Inflation rates higher than the national average
- Average rentals increase due to housing demand

Non-Gas field businesses and residents can struggle:

- Lose employees to the gas industry?
- Commercial space can become very expensive
Community Issues

- Economic Development
- Income & wealth
- Business growth & change
- Have & have-nots
- Workforce Needs

- Rapid Population growth and change
- Cultural & ethnic diversity
- Health and safety
- Municipal impacts
- Infrastructure impacts
- Conflict management
- Local control?
Taking Action Locally to Shape Impacts

Opportunities and Challenges
What Does This Potentially Mean?

- Community focus needs to be on future AFTER the boom, *not just the present*

- Use Marcellus as means to improve economy, social organization, human capital, physical infrastructure – *it is not an end in itself*

- Need public engagement, social networks, collaboration, and communication to address the Long Run, and how Marcellus fits