Impacts of Shale Development in Eastern Ohio

OSU Extension Energy Outreach Program

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Farm Science Review – Sept. 2020
Impacts of Appalachian Basin Shale Play Development Eastern Ohio

OBJECTIVES:

- Share Details About The OSU Extension Energy Outreach Program & Energize Ohio Web Tool
- Provide Community & Economic Development Impacts to the Region
- Provide Agriculture & Natural Resources Considerations for Land Owners
Digital Session Evaluation

Teaching Assessment and Improvement

We will Share a Link in the Chat Today!
Please Complete the Digital Evaluation!

http://go.osu.edu/EEETdIGS_ShaleDevEastOH
OSU Extension
Energy Outreach Program

➢ The OSU Extension Energy Outreach Program team meets monthly
➢ Discuss ongoing energy trends
➢ Learn from invited guest speakers on current energy issues impacting Ohio
OSU Extension Energy Outreach Program

**OSU Extension**
- Christine Gelley
- Dan Lima
- Ken Martin, PhD
- Myra Moss
- Chris Penrose
- Eric Romich
- Gwynn Stewart
- Catelyn Turner

**Other OSU Partners**
- School of Earth Sciences, Dave Cole, PhD
- School of Environment and Natural Resources, Jeffrey B. Jacquet, PhD

**External Partners**
- Farm Bureau, Dale Arnold
- ODNR, Mike McCormac
- Ohio Univ. Voinovich College of Public Affairs, Gilbert Michaud, PhD
OSU Extension Energy Outreach Program

www.energizeohio.osu.edu

- The energy library at energizeohio.osu.edu has a wide variety of energy programs and resources including fact sheets, bulletins and videos.

- A searchable database of energy efficiency and renewable energy incentives can also be filtered to meet individual needs.
Statewide Impact: Since 2010, there have been 300 programs provided to 21,490 attendees.
Community & Economic Development Impacts

https://youtu.be/xQcPKo6qIAE
The Gas industry has expanded in Noble County with the major Seneca energy gas processing facility.

Oil was first discovered in Ohio in 1814 in Noble County when settlers were digging for salt.

The Noble Co. Thorla / McKee Well
Near Caldwell
Over $74 Billion Has Been Invested since 2011 In Ohio’s Utica Shale Play
$57.1B in Upstream
$20B in Midstream
$6.2B in Downstream
More than $32 Billion invested in Appalachian Basin Pipelines

- 3,500 miles
- 🧑 124,000 jobs
- 27 pipelines
Shale Well Status Over Time
2009-2018

https://buckeyehills.maps.arcgis.com/apps/TimeAware/index.html?appid=ec286108e3c843cdaee56e7953bd4539
Shale Well Status
Real Time
ODNR Well Viewer

https://gis.ohiodnr.gov/MapViewer/?config=oilgaswells
Oil and gas companies paid more than $141 million in property taxes from 2011 to 2019.
Oil and gas companies invested $300 million in road repairs in shale counties from 2011 to 2018.
# Road Use Maintenance Agreement

<table>
<thead>
<tr>
<th>County</th>
<th>Road Improvement Costs</th>
<th>Miles Improved</th>
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</thead>
<tbody>
<tr>
<td>Belmont</td>
<td>$62,355,737.70</td>
<td>93</td>
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<tr>
<td>Carroll</td>
<td>$44,715,692.48</td>
<td>99.33</td>
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<tr>
<td>Columbiana</td>
<td>$32,634,228.51</td>
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<td>Guernsey</td>
<td>$53,146,414.20</td>
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<td>Jefferson</td>
<td>$24,056,901.00</td>
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<td>Harrison</td>
<td>$31,409,026.56</td>
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<tr>
<td>Noble</td>
<td>$12,587,467.00</td>
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<tr>
<td>Monroe</td>
<td>$41,757,761.45</td>
<td>72</td>
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<tr>
<td>Totals</td>
<td>$302,663,228.92</td>
<td>639.29</td>
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</tbody>
</table>
Class II Brine Injection Wells

- Active Injection – 221
- Drilled or Drilling – 121
- Wells Permitted – 11
$6 Billion Dollar Shell Ethane Cracker Plant
Monaca, PA

- Announced 2016 (4 states competing)
- Ready for Production early 2020s

- Shell indicates the plant would employ as many as 6,000 construction workers. Once open, it would bring 600 new jobs to the region.

Located just off I-376 in Potter Township
Ethane Cracker

Processing plant that takes ethane and breaks it down by heat to create ethylene, which is a base chemical for plastics.

Natural gas liquids (NGLs) are “cracked” or separated – Ethane breaks into smaller molecules to create ethylene.

Ethylene – a feedstock used in plastics manufacturing.

Polyethylene is used in many products, from food packaging and containers to automotive components.

Source: Shell & Preferred Plastics.com
First of its kind OUTSIDE of the Gulf Coast Region in 20 Years

Five factors support this:

• Abundant Natural Gas Supply
• Access to Water
• Proximity to Market Demand
• Skilled Labor Force
• Cost Advantage

Source: Shale Crescent USA
Project Site Location in Relation to Shale
PTT Global Potential Site in Belmont County

Proposed Site along Ohio River in Belmont County

Why Ohio?

- Better Cost Advantages than National Averages
- Access to Markets
- Lower Natural Disaster Risks

Sources: Shale Gas Reporter & Jobs Ohio

Map By David Benbennick
Low Natural Disaster Risk

“At the request of Congress, we’ve spent a significant amount of time studying the matter ... and there is an incredible opportunity, the potential for establishing an ethane storage and distribution hub in the Appalachian region and for building a robust petrochemical industry in Appalachia,” US Energy Secretary Rick Perry (December 4, 2018)

The map above overlays Earthquake (both moderate and high risk), Flood, Tornado and Hurricane risks in the continental United States. Data for this map was provided by Redcross.org and Noaa.gov.
PTT Proposed Cracker Plant: Former Berger Power Plant Site
Proposed Site along Ohio River in Belmont County

JobOhio has invested nearly $30 million in site demolition, remediation & preparation

Air & Water Permits have been approved

Tax Agreements for Schools & Township Set

- $47.5m over 15 yrs. for education
- $20m in sales tax revenue during construction
### Natural Gas Power Plants

- **12 Projects**
- **$10.02 Billion in Investments**
- **11,702 Megawatts**
- **Serving 9.8 Million Households**
- **6,765 Jobs**

<table>
<thead>
<tr>
<th>Company</th>
<th>Project</th>
<th>Investment</th>
<th>Megawatts</th>
<th>Households</th>
<th>Jobs</th>
<th>Status</th>
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<tbody>
<tr>
<td>Advanced Power Services</td>
<td>Carroll County Energy</td>
<td>$900 million</td>
<td>740</td>
<td>750,000</td>
<td>730</td>
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<td>South Field Energy LLC</td>
<td>Columbiana County Energy</td>
<td>$1.1 billion</td>
<td>1,100</td>
<td>900,000</td>
<td>900</td>
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<td>Oregon Clean Energy LLC</td>
<td>Oregon Clean Energy</td>
<td>$860 million</td>
<td>960</td>
<td>500,000</td>
<td>475</td>
<td>Operating</td>
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<td>Oregon Clean Energy LLC</td>
<td>Oregon Clean Energy 2</td>
<td>$860 million</td>
<td>960</td>
<td>500,000</td>
<td>475</td>
<td>Permitted</td>
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<tr>
<td>NTE Energy</td>
<td>Middletown Energy Center</td>
<td>$600 million</td>
<td>513</td>
<td>600,000</td>
<td>430</td>
<td>Operating</td>
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<tr>
<td>NTE Energy</td>
<td>Pickaway Energy Center</td>
<td>$900 million</td>
<td>1,000</td>
<td>1,000,000</td>
<td>500</td>
<td>Proposed</td>
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<tr>
<td>Rolling Hills</td>
<td>Rolling Hills Generating Station</td>
<td>$700 million</td>
<td>1,414</td>
<td>1,400,000</td>
<td>400</td>
<td>Operating</td>
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<tr>
<td>Clean Energy Future</td>
<td>Lordstown Energy Center</td>
<td>$850 million</td>
<td>940</td>
<td>700,000</td>
<td>700</td>
<td>Operating</td>
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<tr>
<td>Clean Energy Future</td>
<td>Trumbull Energy Center</td>
<td>$850 million</td>
<td>940</td>
<td>850,000</td>
<td>700</td>
<td>Permitted</td>
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<td>APEX Power Group LLC.</td>
<td>Guernsey Power Station</td>
<td>$1 billion</td>
<td>1,650</td>
<td>1,000,000</td>
<td>525</td>
<td>Under Construction</td>
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<tr>
<td>EmberClear</td>
<td>Harrison Power Project</td>
<td>$900 Million</td>
<td>1,000</td>
<td>1,000,000</td>
<td>530</td>
<td>Permitted</td>
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<tr>
<td>Ohio River Partners Shareholder LLC</td>
<td>Hannibal Port Power Project</td>
<td>$500 Million</td>
<td>485</td>
<td>600,000</td>
<td>400</td>
<td>Under Construction</td>
</tr>
</tbody>
</table>

**TOTAL** 12 | $10.02 Billion | 11,702 Megawatts | 9.8 Million | 6,765 Thousand
Natural Gas Power Plants

Monroe County Gas Power Plant

A new 485-megawatt natural gas power plant at former Ormet Plant site

Site of Guernsey Co. Plant

Caithness Energy - $1.6 billion in financing for the construction of a fully-permitted 1,875 megawatt combined-cycle natural gas electric generating facility along I-77

I-77 Photo The Daily Jeffersonian
Community & Economic Development Impacts

https://youtu.be/ywbvW6vXJFU
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mail:
U.S. Department of Agriculture
Office of the Assistant Secretary for Civil Rights
1400 Independence Avenue, SW
Washington, D.C. 20250-9410; or

fax:
(833) 256-1665 or (202) 890-7442;

email:
program.intake@usda.gov.

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TransCanada Buckeye Express
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www.roverpipelinefacts.com/
Shell Site Image by Ruben Campos